A Brief

to the

Alberta Commission On Educational Planning

submitted by members of the

Department of Agricultural Economics and Rural Sociology

The University of Alberta

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RECOMMENDATIONS

On The Post-Secondary Training of Agrologists and Managerial and Technical Personnel in Agriculture and Agribusiness.

1.1 In planning for the education of future farmers, agribusiness managers and agrologists it must be remembered that contemporary agriculture-agribusiness requires more knowledge, more sophistication, more conscious decision-making than is apparent from the traditional concept of farming. To keep this important sector of society competitive and capable of performing its social role requires the infusion of more educational effort, in spite of declining numbers of people employed in this sector. The number of persons with specialized post-secondary training must be increased relatively (per person employed in the sector) and in absolute terms.

1.2 In our experience, university education oriented towards a professional career has important advantages. The student is likely to be exposed to a concrete, goal-directed work ethic rather than to the mere abstract ideals of the "liberal education" concept of the "classic" university (it may be worth remembering that a more ancient "classic" university concept stressed professionalismn its quadri-partite division into faculties - theology, law, medicine and "philosophy"). In the professional faculties students rarely suffer from the apparent aimlessness that is at the root of much current student discontent. At its best a professionally oriented school graduates people more broadly educated

and adaptive as the liberal arts school -- provided, of course, that certain pitfalls peculiar to a professional school are avoided.

1.3 Individualism in methods of university training should be encouraged with as little "structure" as possible. Research into university teaching methods should scout for new approaches and publicize them to fellow educators. A university course on the techniques of teaching young adults would serve as a focussing device for a system of self-improvement of university teaching. However, it should be guarded against the dangers of rigid and premature standardization and codification.

1.4 Vocational agricultural colleges should be strengthened as they serve valuable purposes; their graduates fulfil much-needed functions in the industry, and the colleges themselves have been, and will continue to serve, as the community colleges of rural Alberta.

1.5 Vocational agricultural colleges should continue to offer a diversified program of one-and-two-year courses, diversified towards the particular needs of the agribusiness and agriculture community. The curriculum content of two-year courses should be competitive with those offered by Institutes and Junior Colleges.

On The Rural School

2.1 The curriculum of the rural school should be more than just a blueprint of the urban school curriculum. The curriculum should be examined with a view to two considerations: Is the material presented in a form relevant to the rural child? Is the material presented not prejudicial against the rural mode of living? Official recognition must be given to the fact that a considerable part of the populace must continue to find a living in area-extensive industries which require

on exercise on the idea of this school -- provided, of course, that certain criteria pertaining to a professional school are met.

1.3 Instruction in methods of industrial training should be encouraged with as little formalism as possible. Advanced late maturity certain methods should exist for men apprentices and particularly those in fallow occupations. A university course in the techniques of teaching young adults could serve as a foundation course for a program of university improvement of industrial training. However, it should be pointed out the dangers of rigid and excessive standardization and codification.

1.4 Industrial training institutes should be strengthened as they seem valuable experiment. Their students fulfill undoubtedly functions in the industry and the college-preparatory day schools, and will continue to serve, with the necessary criteria of total effort.

1.5 Vocational or industrial colleges should continue to offer a diversified program of occupation-oriented courses, directed towards the practical needs of the individuals and industrial community. The curriculum courses of two-year duration should be consistent with those offered by institutes and junior colleges.

On the Total School

2.1 The curriculum of the total school should be more than just a synergetic or the mean school curriculum. The curriculum should be evaluated with a view to two considerations: in the material produced in a from relevant to the total "SELF" in the material presented and work-profiles against the total scale of living. Different recognitions must be given to the fact that a considerable part of the population may continue to find a living in area-oriented industries which require

dispersed settlement. The rural school, if not all schools, must make a special effort to offset the implicit prejudice towards urban living pervading contemporary culture, and therefore is reflected in the school curriculum.

2.2 Rural school planning must be co-ordinated with planning in other sectors.

2.3 A flexible and general Alberta Development Plan is suggested as a means to co-ordinate school planning, and provide numerous other benefits.

2.4 A systematic scientific approach to rural school concentration must be designed to take account of the public and private benefits and disadvantages involved.

2.5 New practices in urban education call into question the need for large rural elementary schools.

2.6 The social consequences of school concentration must be considered systematically when wide divisions of opinion are apparent.

Rural Adult Education

3.1 Rural adult education as practiced by the Extension Service of the Department of Agriculture faces a crisis not of its own making. A re-examination of goals, methods and achievements is necessary in order to adjust extension policy to modern requirement.

3.2 It is postulated that agricultural extension caters increasingly to one segment of the farming population and thus contributes to social

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tensions in the rural community. To overcome this self-defeating effect, more emphasis should be placed on broad cultural enrichment type extension. This requires the removal of narrow administrative limitations.

3.3 In view of the increasing importance of adult education, and in recognition that it differs greatly in objectives and methods from juvenile education, to allow it to operate without fear of interference and "in the public interest" and to free adult education from narrow institutional bounds, it is suggested that Adult Education be made the responsibility of a semi-autonomous Citizens' Board similar to University and College Boards.

3.4 If adult education in Alberta is reorganized care should be taken not to destroy whatever is good and worth continuing in existing organizations.

3.5 Teaching methods of adult education and extension are in need of study and development.

I. The Post-Secondary Education of Professional Agrologists, Technicians and Farm Production and Marketing Managers.

A. Professional Agrologists

The staff of this university department participates, jointly with their collegues in six other departments within the faculty of agriculture, in the education of agrologists, i.e. professionally trained agricultural managers, administrators, researchers and educators. Opinions formed in this area are based upon prior training, observation of the needs of the industry and direct experiences in the class room, in the course of conducting research into the industry and its problems, and in frequent contacts through public lectures and various extension activities conducted co-operatively with the University Department of Extension and the Provincial Government. In addition the Department is advised by an Advisory Council consisting of respected and well-informed Albertans engaged in Agriculture and related activities. Members of the department have, from time to time, expressed their views of the desirable shape of training in this specialty (e.g. MANNING, 1952), also: papers for advisory council, 1966, by MANNING, WINTER, LOVE, SCHULTZ - exhibits 1 to 5).

We recognize the education of agrologists as a dynamic business. As the perceptions of needs change, adjustments occur in the curriculum, course content, teaching methods and the role of students in the social milieu of the classroom and laboratory (see, e.g. HAWKINS, 1969, exhibit 6). Given the dynamic nature of agriculture -- rapid technological change with resultant

obsolescence of skills, low farm incomes, obsolescence of rural private and social investments, and large-scale population dislocation coupled with great capital needs on farms for modernization, and in cities for re-establishing migrants -- the aims and objectives of the educational program, too, are in a state of rapid flux. The objectives are often ill-defined; programmatic statements usually lag behind the implicit objectives which are detectable only by evaluating actual practices. The following statement should be judged in this light: it is an attempt to formulate goals for the decade ahead as visualized at this point in time.

I. A. 1.* Aims and Objectives

The training of professional agrologists has aims which we believe should be common to all academic and professional training, with peculiarities imposed upon by the nature of the occupational goals indicated by the discipline.** These aims are, in historical, but not necessarily in order of importance:

Competence. Knowledge and skills for handling tasks to be assigned by society to the graduate; to provide the challenge, the opportunities and the assistance for students to develop their individual skills to the highest possible level.

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* The numbering system employed follows the CEP Basic Data Classification System.

** Graduates of the school of agriculture find employment in a great variety of occupations, many of which are not closely related to their field of specialization. Agrologists end up as plant managers, public administrators etc. just as engineers etc. often end up in occupations broader than engineering proper. This suggests that reasonable broad educational goals are preferable to extremely narrow ones which develop the learner's ability in only narrow realms.

Leadership. To inculcate initiative, ability to understand and handle the social process of decision-making; to avoid turning out mere followers and "organization men".

Adaptivity. To develop concern for continual self-improvement, re-education in accordance with changing needs in this rapidly changing age.

Awareness. of self, society and environment.

These general goals must, of necessity, be geared to the needs of the expected area of employment of the graduate. This area includes, first of all, farming itself. It also includes agricultural administration, research, extension (adult education), and education. According to some proponents, it should also include employment in the complex of business related to agriculture or "Agri-Business" (GOLDBERG, 1958). The training of agrologists is, in many respects, similar to the training of foresters in Schools of Forestry. Agrology as well as Forestry is concerned with the management of renewable or biological resources. According to another proposal, therefore, agrology should concern itself with the "Mangement of Biological Systems" in general. This would amount to "applied ecology". The most recent suggestion for broadening the perspective of agricultural faculties (MATTHEWS, 1970, AIC Review) stresses the teaching of human ecology in the framework of a faculty of agriculture.

The Faculty takes a serious interest in foreign agriculture. It trains foreign students and takes pride in contributing to the International Assistance program of the government of Canada. However it appears that a greater effort in this area is needed.

2. Curriculum

a. Under-graduate program

At present the Faculty of Agriculture at the University of Alberta offers a four-year course leading to the Bachelor of Science in Agriculture (see U. of A. Catalogue for details). A four-year program is considered necessary to inculcate the diversity of subjects required in modern agriculture with the necessary thoroughness to achieve operational knowledge. On the other hand it is recognized that four years is about the maximum length of time a young adult should be expected to spend in formal, and still largely theoretical, training.

The agricultural sciences, on the other hand, suffer the same problems of rapidly accumulating knowledge as other disciplines. Therefore the increase in material can be handled only in two ways: substitution, i.e. further specialization, which has its own severe drawbacks, and intellectual integration of new and old knowledge into "better" operational theories.

This department reviews its curriculum and course offerings every year, with changes occurring almost continually. At present the department recommends four separate options for specialization within its area of emphasis (exhibit 7). Students are expected to develop their own program, however. The options listed allow a considerable degree of flexibility to individualize the program. The department stresses individualization as a desirable educational goal. Students are provided not only with curriculum options, but with course descriptions as well (exhibit 8).

b. Post-graduate Program

The post-graduate program of the department is even more strongly influenced by the specializing tendencies triggered by the knowledge explosion. At present its post-graduate program is limited to agricultural economics and farm management. No post-graduate program in Rural Sociology is offered (exhibit 9 - department prospectus). Some unity is provided by making attendance in one course (Ag. Ec. 502) compulsory for all graduate students, providing a common learning experience and exposure to a unified survey of the entire field. Beyond that the curriculum is specifically designed bearing in mind the student's interests and past experience. Students must take a certain number of courses in the Department of Economics, and are encouraged to enroll in any course offered at the university complementary to their training program. A research project and report (Master's Thesis or Doctoral Dissertation) are considered an essential part of the student's program.

3. Teaching and Learning

This department is rapidly moving away from the strict lecture-type presentation of knowledge. Most staff members stress accessibility (physical presence, avoidance of professorial manners, develop and show concern for student, participation in student activities ...). Since classes are relatively small, opportunities exist for the discussion approach, encourages student participation, time for reading and evaluating essays and similar exercises. Laboratory time and facilities are scheduled. Several courses lend themselves to the use management games which simulate the problems of

farm management, marketing and area planning decisions. Other courses employ video tape replays to enable students to evaluate their own performance (e.g. Rural Sociology 457). Students are given an opportunity to choose parts of the coverage in most courses. Further details may be found in the paper by HAWKINS, 1969 (exhibit 6). Students are encouraged and guided to apply their new-found knowledge to current problems (e.g. the Canadian Wheat Problem). All courses in this department are being taught by qualified academic staff; teaching assistants assist -- in grading papers, supervising and tutoring during lab periods, preparing teaching material -- but are not held responsible for full courses. Experimentation and development of new teaching methods by individual staff members and groups is welcomed.

This approach to teaching is apparently appreciated by students, as enrollment in this department has rapidly increased during the last ten years. It is our impression that we are using the right approach to motivate students to learn.

We believe it is worthwhile to note that most students when arriving at the university fresh from high school must learn initiative; many of them apparently accept the learning process passively. We cannot help but suspect that a conditioning process has taken place during the previous educational exposure of the student which is not condusive to development of initiative.

Since students who have taken time out to work often approach university work not only with "maturity" and determination, but with greater enthusiasm than students fresh from high school, we suggest that one remedy for the situation would be a transitional trainee period, which would give

prospective university students an opportunity to sample life as it is, before renewing their efforts to complete the 16-year-and-up course of formal education. This would be helpful provided it is not some kind of glasshouse experience, but the real thing.

4. Personnel

Just a few notes:

(a) We consider it essential that teachers at the post-secondary level are really up-to-date in their field. One of the best ways to ascertain this is to encourage university teachers to take an active interest in their subject in the form of research, consulting and participation in adult education (extension). While the linkage of teaching tasks with other obligations produces some loss in terms of technical efficiency, in our opinion this loss is more than offset, by the stimulation which reinforces the teachers motivation to teach, and maintain the currency and solidity of his knowledge of the subject. The tie of research and teaching, if administered judiciously has the effect of a program of "continuing instructional improvement".

(b) Training of university teachers in teaching techniques: the Faculty of Education should be encouraged to offer a course surveying the field, primarily for members of the teaching staff itself. Since the teaching methods employed in universities are, and should be, quite different from the methods employed for younger age groups, such a course will have to stress the tentative nature of its contents and rely heavily upon the transformation of actual experience rather than ex cathedra learning. Research into teaching methods and measures of "success" would be a necessary adjunct to such a course.

5. Facilities

A recent book by A.G. Oettinger, Run, Computer, Run (Harvard University Press, 1969) should be brought to the attention of the Commission. According to the review by Rossi (Science, 20th March, 1970, p. 1607) the author points out the dangers of expecting that "machines will take over a large portion of the instructional burden within the next decade". The expection should be tempered by recognition that (a) machine instruction, even with the most efficient configurations now known to be feasible, will cost at least ten times as much as conventional instruction. (b) most schools have not been able to utilize even simple technology such as audio-visual aids effectively in the classroom. (c) the human skills needed in setting up machine-assisted teaching must be developed first.

6. Planning, Research and Development

Budgetary and personnel planning in this department has been based from the beginning (1962) upon enrolment forecasts by the chairman of the department. Enrolment forecasts for entire school systems are considered a reliable aid. Vital statistics are among the most reliable statistics available. The only uncertain factor in such forecasts is the assumption of stable economic conditions. Offsetting economic events can upset such predictions.

By contrast forecasts for enrolments in small disciplines depend on many more uncertain variables than forecasts for entire systems. Nevertheless the use of departmental forecasts have been helpful and are recommended.

Further planning should concern itself with the effect of a particular teaching approach upon the future performance of the graduates. For

example, it is sometimes argued that since the number of farmers is declining, the academic study and teaching of agrology should be curtailed. In reply it must be said that the increase in the knowledge of farming methods etc. has been essential in increasing the standard of performance and the standard of living on the farm. Furthermore, it has encouraged specilization and vertical diversification in the industry so that today many traditional farm functions are performed in separate industries (processing, farm supply manufacture ...). (DOANE, Vertical Farm Diversification, 1950). The training of competent agrologists will assume greater importance rather than smaller, as farming quality rather than quantity of physical strength and labour is required. It is for this reason that we see increasing rather than decreasing demand for agricultural education at the post-secondary level.

B. Agricultural Technicians, Production and Marketing Managers

Just because many young people can be expected to benefit from training for professional practice of agrology at the university it does not follow that all will. Furthermore, whatever statistical evidence exists tends to suggest that the bulk of farm operators will not benefit greatly from education at the university level (this is not to deny the value of university education for farmers in a position to fully utilize the mass of learning gathered in four years or more at the university). Thirdly, a great deal of specialist knowledge is needed at the intermediate technician and management level of agri-business firms, government agencies and major farms.

It is for these reasons that we recommend the continued support of the provincial Schools of Agriculture. The existing schools should be encouraged to build up their offerings, to diversify (as they are now in the process of doing), and to adapt their curriculum and teaching approach to modern requirement in any way they can. Modern farming is such a complicated and diversified business that it requires all the expertise it can obtain.

In this connection it might be well to point out the need to build alternate approaches to further formal education. Many young people decide to attend university after several years of experience. Graduates of the Schools of Agriculture should be given an opportunity to transfer into certain university curricula, allowing them to transfer credit for work done at the Agricultural School.

II. Socio-Economic Trends in Rural Alberta and the Rural School.

1. Areas of Concern.

While the members of the Department of Agricultural Economics and Rural Sociology are not directly involved in the educational planning and decision-making concerning the rural school, there are a number of areas of common concern. These areas include the following:

(1) The value of formal education and of particular forms and levels of formal education upon the economic success and the social achievement of farmers.

(2) The contribution of rural families and the rural school to the pool of well-motivated manpower, knowledge, skills, and investable funds as fuel for the economic growth of the nation.

(3) The burden of the rural school upon the rural and especially the farm taxpayer. (Is he paying for training of kids who will move to the city in a productive capacity?)

(4) The effect of rural schools upon purchasing power in certain rural communities by attracting Tax Foundation funds in excess of what the communities contribute to the fund themselves.

(5) The problems of centralization and regional planning brought about by large-scale population shifts in the countryside and the changing transportation and communications system.

(6) Reconciling educational policy with the prevailing attitudes of the rural population.

(7) The impact of the burden of school re-location and centralization upon classes of rural citizens.

(8) The value of educational diversification and motivation in the services provided by the rural school.

(9) The role of the school in rural development.

2. The Value of Education in the Occupation of Farming

Statistical methods have been employed to attribute social product and economic growth to one of several types of resource inputs, land, capital, labour, and, increasingly, to what has been variously defined as knowledge, education, schooling, human capital or "human resource". Exhaustive studies by DENNISON (The Sources of Economic Growth in the United States. New York: Committee for Economic Development, 1962; DENNISON & PULLIER, Why Growth Rates Differ, Washington: Brookings Institution, 1967) establish positive relations between the level of education of the labour force and "advances in knowledge" and economic growth.

Unfortunately Dennison's pragmatic growth theories are of the "black-box" variety: it is not known how exactly measures of education relate to productivity. The relations differ substantially between the nine Western countries investigated. One may expect important interactions of time, place, resource, social and economic structure with the variables measured. Extension of the findings to other countries requires therefore empirical verification. Certainly the sources of productivity in individual sectors of society cannot be inferred from these global studies. There have been comments which discount

these studies of statistical relations of personal income levels and educational attainments; the observed relation is said to reflect primarily the capability of the individuals rather than the impact of the educational system upon society (FIRESTONE?).

Little is known about the impact of specific kinds of formal education in terms of method, stress on knowledge, motivation, attitudes etc. type and level of knowledge conveyed. Bold generalizations therefore seem suspect.

In the field of agriculture the problem has been the subject of speculation but also empirical study and rigorous analysis. Formal education usually is viewed as only one of many kinds of inputs. Studies either are of the global "attribution type" as used by Dennison, or focus upon the impact of the "human factor" at the farm level. Examples of the first type are the papers by GRILICHES, American Economic Review 54:961, 1964; TWEETEN & TYNER (Journal of Farm Economics 46:1075, 1964 and Journal of Farm Economics 49 (3): 749, 1967; GISSER, Econometrica 33:582, 1965; GISSER, American Journal of Agricultural Economics 50 (3):621, 1968; GARDNER, American Journal of Agricultural Economics 51 (4):753, 1969; WELCH (The determinants of the return to schooling in rural farm areas, Ph.D. dissertation, University of Chicago, 1966). Crudely summarized, the studies agree that in the United States (with social and economic structure of agriculture similar to Canada's), positive financial returns may be expected from formal education on the average farm up to grade 12.

Studies focusing upon the impact of human factors generally are studies of the role of the person, the operator-manager of farms, as opposed to the role of the given material resources, land, capital and labour.

Extensive summaries of research in this area may be found in:

W.M. SCHULTZ, Theories about farm managerial ability. Department of Agricultural Economics, University of Alberta, 1966.

MINNESOTA. UNIVERSITY. AGRICULTURAL EXPERIMENT STATION. The Management Factor in Farming: An Evaluation and Summary of Research. Technical Bulletin #258, 1968.

G. MUGGEN, Human Factors and Farm Management: A Review of the Literature. Commonwealth Agricultural Bureaux, Farnham Royal, Bucks, England. WAERSA Reprint #10, 1969. (also: World Agricultural Economics and Rural Sociology Abstracts 11, 2, 1969).

STRAUS (Washington Agricultural Experiment Station Bulletin 588, 1958) finds that formal education (as measured in years of attendance) by itself is not a strong predictor of farm success, certainly not attainment above grade 12. He finds that, instead, previous managerial and administrative ability and knowledge of local conditions are strongly associated with success in Columbia Basin irrigation farms.

Most other studies recognize school attendance as a separate factor and find it positively contributing to farm success however defined (e.g. MACEACHERN et al., 1962; RUST 1962/3). Yet there is a strong suggestion of diminishing returns, given the existing farm structure. Beyond a certain level further school attendance is not reflected in increased farm success.

Many attempts have been made to express managerial ability in the form of a composite index. Many of these indices incorporate years of school attendance; invariably there is a positive relationship between managment index and farm performance (e.g. AUER, 1961; PUGH et al. 1965, and several M.Sc. theses written at the University of Alberta since 1966 ... ALLEN, BUCKMIRE, ROSS).

All studies cited contribute little to the question of the kind of education most desirable for future farmers. We must rely on conjecture and analogy from other places. Thus TRACY (Agriculture in Western Europe, London 1964), p. 108 notes the fact that Danish farmers were well prepared to meet the agricultural crisis of the 1880 ties with "a high standard of both general education and technical agricultural knowledge". Both ROVETCH and NESIUS in: (Problems and Policies of American Agriculture, Ames, Iowa, 1959) attempt to draw inferences for the organization of rural education.

While Alberta schools certainly are pulling their weight in providing general education, one might well question whether they provide a sufficient portion of knowledge useful in agriculture (e.g. natural and social sciences as applied to agriculture and the rural scene), which at the same time is not too specialized to be useless in other occupations. Skills and values do not grow in a vacuum, but must be nourished on a substrate of practical applications nudged along by the student's motivation. This is supremely important in a social adult environment where primary reliance is placed upon empirical, visual-evidence learning rather than deductive reasoning (vix. KNIGHT & GREVE, Kansas Agricultural Experiment Station, Technical Bulletin 107, 1960 and JOHNSON, A Study of Managerial Processes of Midwestern Farmers, Ames Iowa, 1961).

Once essential needs of general and technical knowledge are satisfied, there remains the further question of the role of schools in shaping motives and values of young people: are the motives inculcated (cf. MCCLELLAND, The Achieving Society, Princeton, N.J., 1961) a good preparation

for the society which Alberta will be one generation hence? Will the education offered in the school system provide for the farmers who will run the sophisticated farms of the year 2000? Will it develop the right balance of achievement motivation, sociability, innovativeness, competitiveness and co-operativeness, respect for realities and vision of the potential of mankind and each man, a proper respect of the ultimate limits of nature upon which agriculture depends. Will it permit farmers to see themselves without false pride and without the destructive defensiveness of a small, unappreciated and economically exploited minority? Will the school system develop a proper appreciation of the role of this ancient yet essential, this often misunderstood, praised and condemned segment of scoiety in all its students? Will it be able to describe agriculture as it is and will be without false sentimentality, with the clichees of the past, just matter-of-fact: an industry with the same aspirations as the rest of society, with unique problems stemming from the extensive deployment of its practicioners and the need to live with nature, large but diversified, puzzled and puzzling yet secure in the knowledge that it contributes in measured and unmeasurable ways to the welfare of society and its very survival?

3. Research Into Rural Society, Rural Politics, and Rural Schools

700,000 Albertans live outside the five major agglomerations of Edmonton, Calgary, Lethbridge, Medicine Hat and Red Deer. Most of these 700,000 Albertans may well be considered "rural" in terms of their social relation patterns, even though government statistics define "urban population"

as all those living in incorporated places of 1,000 population and over. It is indeed remarkable that very little if any social research is being conducted into this large segment of our society. In comparison, urban society is given practically exclusive attention in political science, and educational research and services. Social research, notably anthropological research, is focussed almost exclusively upon the perhaps 50,000 Indians and Metis, of rural and urban residence. Not unreasonably, voices have been heard that this segment of society is being researched to death.

By contrast rural (and "town") Alberta apparently is some kind of social no-man's-land. Whatever sociological "knowledge" we have of this part of Alberta, is derived by inference from the vast mass of studies being conducted elsewhere, often many years ago. It is perhaps no accident that attitude towards the rural population, and especially the farming population, is characterized by a disturbing cultural lag. Whatever sound and realistic knowledge we have stems from the first-hand, albeit rough-and-ready and often not "scientifically" verified experience of the practicing politician and public administrator.

Why are social scientists taking so little note of rural and town-dwelling Alberta? Is this accident? Does it happen by default? Does rural Alberta lack the headline-making, attention gathering glamour of the minorities? Is there an unconscious assumption that before long all Albertans will live in cities anyway, so there would be no use anymore for knowledge gathered in and about rural social processes, values and institutions? Or is there some hidden bias against the "country cousin", this age-old prejudice of the

"urbane" intellectual (cf. JESSER, Rural Sociology 32, 1:56, March 1967). Is there a "band-wagon effect", this curse of modern science (PLATT, Science 154:1132, 1966)? Do social scientists see only what goes on in their immediate environment, the city, the society of academic peers, the money society? Do they by chance believe in the off-hand and completely unverified "global village" hypothesis of the "The-medium-is-the-message" school of thought?

We are concerned with the grave consequences of the evident lack of interest of the social and educational sciences into rural society. The trend towards the super-city cannot be inferred from the present migration trend by simple linear or even exponential extension. If anything, communications technology, the increasingly heavy burden of social cost of living in the super-city, and the growing sophistication of environmental planners will retard this trend. By the year 2000 the flow to the suburbs might have developed into a flow to the satellite town. Furthermore, a number of economic activities in Alberta are area-extensive, and will require that a certain share of the population will continue to live in a dispersed pattern, no matter how great the cultural-economic pull of the major centers. Among these industries we note agriculture, mining including petroleum and gas primary production, lumbering and pulpwood harvesting, forestry, wildlife, outdoor recreation, highways, railroad and pipeline maintenance. It is impossible to visualize these activities being concentrated in as few as five urban agglomerations in the province (local tendencies towards community residential patterns notwithstanding). All these area-extensive "economic-base" activities will draw their share of people employed in the service industries including educational services. It is then only common sense to

attempt to increase the viability of the numerous small settlements required to house and service the area-extensive industries by locating, as far as possible, other "foot-loose" industries. There is a pattern of retirement of farmers into rural communities rather than into the big city.

It is evident that rural society will not disappear within the near future. No matter how much it will change in settlement patterns, in urbanity of tastes, social services expected, even in occupations pursued by its members it will retain the characteristic feature of rural societies: its low area density and the social behaviour that is associated with it (cf. S. MILGRAM, "The Experience of Living in Cities," Science 167, 1461-8, 13 March 1970).

Rural society will retain characteristic features that sets it apart from urban society. It is by no means clear today to what extent its characteristics will render rural society more viable, more resistent to crisis, more stable. It might well be that rural society or something akin to it will always be needed to counteract the hectic, fast-moving, innovative, progressive acquisitive but fickle and inherently instable urban society. History gives us examples of urban societies which destroy themselves as well as others which persisted for ages. Our times are in many ways different from ages past; science hesitates to draw inferences from the readily quoted percept of heroic republican and depraved, affluent imperial Rome upon our age. Neither have we synthesized a theory of social survival based on our present incomparable technical prowess and puny institutional safeguards and stabilizing mechanisms to keep society from foundering by

failing in the areas that do not get attention. (We might be able to control radioactive fallout and nuclear holocaust while we watch these potential troubles, while mercury and lead poisoning creeps up on us unnoticed, racial conflict renders once-viable societies apart, and social ennui drives the most active young people into the oblivion of drug dependency, perhaps just because we tried to make the world safe and affluent for them).

Unless proven otherwise, rural society is worthy of attention commensurate to that given to other parts of society. Neglecting to study it with care and concern does not hurt its members directly, but it deprives us of much valuable knowledge, unbalances the awareness of society of itself, and hence biases social and political decisions.

For example, lack of appreciation of the opportunities in the small community invariably rivets attention of the professional, the engineer, the bank manager, the teacher, upon a career in the city. Farmers considering to change their vocation invariably are referred to the city for an alternative job. Enterpreneurs don't even consider small towns as potential sites for their activity unless absolutely forced to. Perhaps worse, the bias of attention and the public spotlight breeds a contempt for rural life in rural and urban citizens entirely unwarranted in terms of its potentials no matter how much justified such views are in terms of past experience.

Perhaps no other manifestation of public decision-making manifests more the proverbial shortsightedness of public policy than the one-sided focus on urban and minority social affairs. We would like to stress the need to view the rural school without this deep-seated and hardly recognized bias,

in order to make recommendations for the future that rectify past neglect and avoid self-perpetuating built-in biases. The model of the rural community in Alberta and its school must not be New York City, but Red Deer, not London but Swindon, not Glasgow, but Greenock.

4. The Role of Rural School Planning in Spatial Development of Rural Alberta

In the preceeding section it was argued that area-extensive basic economic activities can be expected to continue in the forseeable future, and quite likely forever. This means, for the school authority, the educational planner, that the design of rural school curriculum, staffing, administration, "plant" location, projected school size, financing etc. etc. is not going to be something provisional, but continuing task.

But it is also clear that the existing settlement structure in rural Alberta is in a state of flux. Long-term planning, therefore, should proceed on the basis of what can be expected to exist in 10-20 years rather than on the basis of the present residential structure.

Historically, a hierarchial structure of settlements has developed wherever social organization went beyond the clan level. In western Canada the development of the residential structure occurred rapidly. Within a single generation the network of railroad stops and six-mile-square township centers (cf. GALPIN, Wisconsin Agricultural Experiment Station, Research Bulletin 34) became obsolete because of the introduction of the automobile and the construction of an extensive all-weather road system (cf. Karl FOX, in: Research and Education for Regional and Area Development, Ames: Iowa

State University Press, 1966, p. 13, and in: Stimulants to Economic Development, Alberta Department of Agriculture, 1966, p. 103). This new technology increases the commuting distance of the rural resident by one order of magnitude (the ratio of the speed of horse-and-buggy and the modern automobile). Theoretically, a ten-fold increase in the action radius of the rural resident would lead to a hundred-fold increase in the size of the trading area of the central places. Invariably this will result in concentrations of commercial and administrative activities in fewer places, as important economies of scale can be realized (the merchant can increase his trade volume, distribute his overhead over more customers, can increase the variety of his stock, reduce prices. The per capita cost of public services and public administration can either be lowered or the quality of the services offered be increased). A natural process of selection has reduced significantly the number of self-contained residential centers, and downgraded the role of most. This process has now proceeded to a point where it appears desirable to channel it into an orderly pattern of hierarchical relations between the remaining communities. FOX (loc. cit.) sees in Iowa a pattern emerging of major "functional regions" each with one central city. A similar process apparently has operated in Alberta (cf. SCHULTZ, exhibit 9). There already exists a natural pattern of major functional regions in the well-settled parts of Alberta.

The existence of such a pattern does not mean that all smaller communities are doomed. There will take place an increasing specialization. BERRY, in: Research and Education for Regional and Area Development, p. 56). Smaller places will continue to play an important role as the suppliers of

the daily needs of the rural resident. There will continue to be neighbourhood general stores, grocery stores, service stations, farm supply houses, local processing plants. There will continue to be a neighbourhood (township) pattern of intensive social relations, neighbourhood public service including, of course, local schools.

Local and provincial school authorities have manfully tried to plan schools in the face of this manifestly instable residential pattern. They have frequently encountered the stubborn but reasonable resistence of rural residents who rightly see their local school as a pivotal factor of their communal existence. The process of change has intensified conflicts of interest and rivalries between communities, has resulted in stalemate, delay, bitterness and frustration. Resistance to planned school concentration has its roots in social, economic and biological factors which have their rights. It appears that the process of school concentration has now generally reached a level where further change encounters critical resistance.

This seems to be an opportune time to try and bring into perspective the change in residential pattern which has occurred, explain it to Albertans, and spell out in a provincial development plan what future changes can be expected during the next thirty years. This task transgresses the responsibility of individual provincial departments. It is a political task, since it might touch the lives of the many. Since it is political, it must not be left to professionals only, but must be conceived and carried out within the political process.

The advantages of spelling out regional development trends and goals would be numerous, though. All government agencies would have a basis

to coordinate their respective concentration plans. Private business could plan ahead with greater confidence in its future (removing a major obstacle for small business to invest in small communities), and last but not least local residents could plan ahead more rationally and confidently for their future. Such master development plan would assist everyone in making material and human investments more intelligently, therefore increasing efficiency all around, reduce frustration and disappointment. It appears to be an essential requirement for an intelligent area development policy, for school location, road planning etc. Such plan need not be too specific and must not be inflexible. It should leave the details of local arrangements with the regions concerned. The Provincial Planning Act visualizes a degree of decentralization, but it is conceived on a narrow base, within the confines of municipal administration. It bogs down in details, in planning subdivisions, road allowances, and public water supplies.

As it stands today, regional planning authorities are stifled precisely because they lack directions from a provincial master plan as well as from their immediate political supervisors. The Provincial Master Plan must come from an authority with the strength to overcome the tremendous political pressures of particular interests, i.e. the entrenched political institutions and communities. It requires the empathy to listen patiently to all the particular claims, the wisdom to combine the art of the possible with the vision of the desirable, and the intelligence to formulate its precepts so that they will be acceptable coinage on the political market place of ideas.

5. Further Observations Re School Concentration

(1) There does not appear to be any systematical comparison of the social disadvantages and benefits of busing children to large schools (as investigated, among the few sources extant, by HUNKA, et al.) against the social disadvantages and benefits of maintaining smaller schools. Arguments are usually heated, but not enlightened by a rational calculus of social disadvantages and benefits. We submit that the heat of political battle might be suitably quenched by measuring the social disadvantages of, among others, children's loss of achievement motivation and actual achievement by spending time on the bus as a function of school size, population density etc.

(2) In elementary schools in Edmonton we note a tendency to group children of several grades in the same classroom, under the same teacher. If this is tolerable, or under prevailing educational philosophies, even desirable, we cannot see much wrong with maintaining rural elementary and even junior high schools with as few as 2 - 4 classes.

(3) School concentration pushed through against the will of a sizeable minority of residents cannot help but distract from the educational achievement, since it places many children into an attitudinal conflict between their parents and the school. In extreme cases this may be as deleterious as the well-publicized conflict between Indian parents and the educational establishment presumably catering to this segment of Canadians.

(4) We can see little advantage of planning regional schools in a wheat field, or some theoretical geometrical center of their service area, unless there is strong evidence to believe that other communal activity will

be attracted to the place. Schools must be planned as integral parts of viable communities, not in competition with them.

(5) Apparently the policy of considering one school building project as a unit, without consideration of the context of existing schools, leads to some inequities in the quality of education being offered to students residing in various districts. In Edmonton, we note that exemplary "state-of-the-art" and even avant-garde schools exist for the benefit of students in some districts, while students from established districts are being served in old buildings. While this is unavoidable, it appears necessary, in the interest if equitable service to all students, regardless of residence, that old schools are brought up to the standards of the newer buildings, even if this means sacrificing some of the standards of the newer buildings, even if this means sacrificing some of the most expensive "frills" of the modern showplace schools. The reputation of a school system should be measured not by its most outstanding examples, but by its overall performance. We would hope that the experimental "innovation fund" recently announced by the government develops into a program to update old and serviceable schools regularly, in order to maintain their functional value on a par with new buildings.

(6) It has been observed that certain municipalities are adorned with expensive school buildings who have been designed with obvious life expectancies of 75 years and up, when there is justified doubt that the communities will have a sufficient school-age population to serve within the next 30 years. We wonder if it is possible that the administration of the Alberta School Buildings Act does not encourage, or even require, many communities to "over-build" in order to demonstrate standards required by the Act.

It appears that in the face of reasonable doubt about the long-term future of many rural communities it is justified to approve expensive school construction with long life expectancy. Most industrial and residential construction is designed with a 20-40 year life expectancy. This should be entirely acceptable for school construction in Alberta. It should be avoided that municipalities are enabled to "feather" their political future with the unwilling assistance of the School Foundation Program and the School Buildings Act. It would appear reasonable to review past construction by a panel of planners, economists and educators.

III. Lifelong Education in Agriculture and the Rural Community

That this fast-paced age requires adult education to maintain the social usefulness of individuals is conventional wisdom. Adult education serves three major purposes, and tends to be organized towards these separate objectives:

The upgrading and complementation of job skills,

Cultural enrichment and broader stimulus responsiveness,

Job retraining.

The first two objectives have long been recognized in agriculture and have been met successfully by the Fxtension Service of the Alberta Department of Agriculture and the Department of Extension of the university. However, circumstances have changed enough to move the government to have commissioned a thorough study of agricultural extension in the province. Therefore not much can be said about this topic at the present time. We would like to draw the attention of the Commission to the following:

1. This department is the only one at the university offering any course on methods of rural extension (Rural Sociology 457). This is a new course, and reflects the importance which this department currently attaches to rural extension.

2. The entire extension and continuing education effort of this university currently focussed in the Department of Extension emanated from the position and the personality of the "Agricultural Secretary" of the university. This position was held by men like Ottewell, Corbett and Cameron. These men operated in the spirit of Tory's dictum:

> The people demand that knowledge shall not be the concern of the scholars alone. The uplifting of the whole people shall be its final goal. (1908. Quote taken from "The New Trail", Nov. 1968. p. 22).

We believe that the university must honour Tory's program today. We look forward to seeing more, not less community involvement of this university especially in rural Alberta. The present institutional arrangements confine this university unnecessarily to an artificial ivory tower environment. Nothing would help to lift the ivory tower veils from the eyes of scholars than direct confrontations with the problems of "the people". Giving scholars a role in extension would do a great deal in rendering the work of the scholar more effective and shortening the path towards the "uplifting of the whole people" through knowledge.

3. The agricultural extension effort in this province, as elsewhere in Canada, de facto has been increasingly focussed upon the provision of technical farming information. One of the public goals of this approach is the increase in productivity and competitiveness of the farming industry. Extension has been successful in this endeavour. But in doing so, by using the well-exposed route innovator-early adopter-early majority (see BOHLEN et al., North Central Regional Extension Publication no. 13, Michigan State University, 1961), it has intensified the economic and social differentials naturally occurring within the farming community. Extension efforts will naturally speed up the adoption process and rely upon the socio-economic gradient between early and late adopters to pull the majority along. In the process the gradient will become steeper, the social tensions increase. It appears as if traditional agricultural extension faces a critical period.

The farming community is in a certain danger of being politically polarized into the technically progressives and the traditionalists. Extension is clearly advantageous to the first group. In providing its services to it, it unwillingly works against the latter group and becomes party in a class conflict which it would dearly avoid.

4. The incipient conflict might be avoided or mitigated if the role of agricultural extension is refocussed upon broader front, less specialized but more culturally and socially oriented. This would be a partial return to an earlier policy which stressed the need for cultural enrichment of the rural adult population, a policy which led directly to the magnificent accomplishment of two Alberta educators, E.A. CORBETT, the initiator, and D. CAMERON, the organizer and moving spirit behind the BANFF SCHOOL OF FINE ARTS. It is apparent without further elaboration that the Banff School, invaluable as it has become, does not provide a sufficiently broad involvement of all Albertans, much less of rural residents, in the fine arts and the other vehicles of the social and cultural enrichment of human society. In our view a new and broader approach is needed. There have been some efforts in this direction. Regional specialists have relieved the District Agriculturalist of the need to be a super-specialist. Agricultural Service Boards have relieved him of some of the administrative and supervisory functions. But extremely narrow defined constitutional and institutional barriers limit successful, integrated rural adult education at every turn.

5. Ideally, extension or continuing education should be made the responsibility of a separate Adult Education Board at the provincial level,

with representatives of the public, the professional educators and adult education sepecialists, the institutions which will be expected to provide some of the services (school boards, municipalities, the universities, several government departments). A regional sub-structure should assure grassroots appeal. This may appear drastic, but no arrangement short of a radical one can be visualized which would bring about the needed improvement in adult education quickly, without getting bogged down in service rivalries, federal-provincial-local feuds etc. which serve only the narrow vested interests of a handful of public officials, and frustrate the public.

6. A few years ago, concern about the evident inequities of financing education from local property levies alone led to the revenue equalization arrangement known as the Tax Foundation Program. Regional inequities in adult education are no less real, and affect the chances of life success of residents of the province in different ways. A member of this department, Dr. T.A. Petersen, has pointed out this problem in a study of Eastern Washington. We wish to bring this report to the attention of the Commission in the belief that it has relevance for the Alberta scene (exhibit 10).

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GRADUATE EDUCATION IN AGRICULTURAL ECONOMICS[1]

TRAVIS W. MANNING[2]

Graduate education has been a subject of concern and debate in North America for the past 100 years, and many of the more critical issues are still unresolved. One of these critical issues is the lack of uniformly high standards for graduate degrees.

The Increasing Needs for Graduate Education

North America has a long tradition of dependence in graduate education – formerly by North Americans going abroad for graduate training and more recently by attracting immigrants holding advanced degrees. Prior to 1900 most North Americans with earned Ph.D. degrees received them in Europe, primarily in Germany. Few American universities offered graduate programs before 1876, and most of the Master's and Ph.D. degrees granted in the 19th century were honorary or unearned degrees.[3] Canada has been largely dependent on the United States and the United Kingdom for graduate education. According to Dean McCalla of the University of Alberta, only two universities in Canada offered reasonably complete graduate programs in 1950, although there has been considerable progress since then.[4] As one indication of our dependence on other countries for graduate training, over 60 percent of the staff of the University of Alberta who hold doctoral degrees received them in the United States, and another 20-25 percent received them in Europe. In the field of agricultural economics almost all of the Ph.D. holders in Canada got them in other countries.

The magnitude of the graduate training problem in Canada has been summarized ably by McCalla:

> A few universities are reasonably well staffed at the moment, but they have relatively few top level individuals and the loss of these few could wreck the graduate education at any one of these institutions including the University of Alberta. Furthermore, the potential demand for new

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[1]Paper presented to the Canadian Agricultural Economics Society, Winnipeg, 1965.

[2]Department of Agricultural Economics, University of Alberta. The author is indebted to Walter B. Rogers and George R. Winter for reviewing the manuscript and making many useful suggestions.

[3]Bernard Berelson, *Graduate Education in the United States.* (New York: McGraw-Hill, 1960), p. 11. This book is based on a study made under a grant from Carnegie Corporation of New York, and it contains an excellent review of the development, problems, issues, and present state of graduate education in the United States.

[4]A. G. McCalla, "Agriculture, Education and the Canadian Dilemma," Edmonton Branch, AIC-AIA, p. 7.

> staff in the next ten years far exceeds the prospective supply. Since we won't be able to get such staff from the United States or the United Kingdom, we must increase our own potential to educate the required staff. We will certainly lose some of those we now have, particularly to the United States, and we will lose far more than we can afford unless we can offer facilities and salaries much more competitive than most of those in Canada at the present time.[5]

The needs for agricultural economists with advanced training undoubtedly will increase in government and industry as well as in educational institutions over the next ten years. While the increasing needs are obvious, the growth in "market demand" is less certain. As McCalla pointed out, we do not offer facilities and salaries adequate to promote the needed rate of growth in graduate training or to retain a sufficiently large proportion of those we do train. Canadian salaries for agricultural economists are generally lower than American salaries for comparable positions, especially in government agencies. Consequently, it has become increasingly difficult to attract Canadians back to Canada after they complete their graduate training in the United States. Industry's demand for agricultural economists probably will force salary levels upward as it has in the United States. It seems highly probable that the combined demands will be sufficient to induce a substantial increase in numbers of agricultural economics students in Canadian graduate schools over the next decade.

Standards in Graduate Education

Standards for graduate degrees have been a problem ever since the inception of graduate programs. Some of our problems today, particularly with the Master's degree, probably stem from the early days of transition from their use as honorary degrees. The predicted pressures for increased quantity of graduate training undoubtedly will create more problems for maintaining quality standards.

Standards for the Master's Degree

The Master's degree is in many respects the least satisfactory degree offered by North American universities. As early as 1902 the Association of American Universities was debating whether it should be a terminal degree or a stepping-stone to the doctorate, and the debate on purposes and standards still continues.[6] The degree is based on a variety of standards varying from a single year of course work to a rigorous three year academic program. Although there is little uniformity in objectives or standards and it is generally recognized that the degree has lost prestige, there is a general consensus on the need for the degree so it continues to be given in ever increasing numbers.

The purpose of the Master's degree should be defined in terms of achieving a respectable level of academic competence and professional

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[5]*Ibid.*
[6]Berelson, *op. cit.*, p. 185.

ability. The Master's program should serve a dual function — as a terminal training for those who wish to become professional economists at a practical level, and as preparatory training for those who aspire to continue toward the Ph.D. The degree should not be debased by granting it as a consolation for failure to qualify for the Ph.D. or as a certificate for the completion of a fifth year of more-or-less specialized course work, nor should it be granted automatically to those who successfully complete the course work required for the Ph.D.

The standards for the Master's degree should be high enough to assure professional competence. The need for improving the standards for the Master's degree has been stated ably by Bowen in his monumental report on graduate work in economics. His viewpoint is summarized in the statement "That degree should be reinstated as one signifying a substantial accomplishment in economics and a level of professional competence as an economist."[7] Bowen makes strongly convincing cases for the thesis requirement, a high standard of course work accomplishment, and the requirement of the Master's degree preliminary to admission to the Ph.D. program.

The establishment of uniformly high standards for the Master's degree should be given priority by departments of agricultural economics. Graduate education tends to follow Gresham's Law — the bad forces out the good. A high quality Master's program is needed as a foundation for building a successful Ph.D. program; there is little likelihood of achieving a high quality Ph.D. program without first putting the Master's program on a sound basis. The standards for the Master's degree should be defined in terms of (1) a desirable level of course work accomplishment including undergraduate preparation, (2) a higher level of academic achievement than is required for the Bachelor's degree, and (3) demonstrated competence in economic analysis and communication.

Standards for the Ph.D. Degree

The purpose of the Ph.D. degree has been defined traditionally in terms of the standards of the academic profession, although an increasing number of government and industry positions require the degree. The purpose of the degree should be redefined to meet the broader needs but without diminishing its academic standards. The Ph.D. should provide assurance of thorough grounding in the general discipline, mastery of the special field, and a high level of competence in research and communication skills. Although the Ph.D. is a terminal degree, it should be regarded not as the terminus of the learning process but as the basis for continuing educational development. Perhaps it should not be considered even the terminus of formal education but should be renewed periodically as the field of knowledge expands and the needs for such knowledge develop.

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[7]Howard R. Bowen, "Graduate Education in Economics," *American Economic Review*, XLIII, Sept. 1953, p. 59.

There appears to be a greater consensus regarding standards for the Ph.D. than for the Master's degree. However, this consensus seems to be honored more in concept than in practice, and it is common knowledge that quality standards vary widely between different universities. Two of the most current topics of debate on the Ph.D. concern its adequacy as preparation for teaching and its general adequacy as the highest academic degree. The debate over creating a special degree or variety of the Ph.D. for teachers as opposed to researchers does not appear to be of particular concern in agricultural economics because it is an applied field with a heavy research orientation. The general inadequacy of the degree does seem to create more concern as evidenced by the growing emphasis on post-doctoral training.

The opinion has often been expressed that the quality of the Ph.D. has been adversely affected by the greater number receiving the degree and the increasing demand by certain types of employers for people holding the Ph.D. degree. Obviously, the proportion of the population holding the Ph.D. cannot be increased indefinitely without reducing standards of achievement. However, there appears to be no conclusive evidence that the point of diminishing ability has been reached. Thus pressures to reduce academic standards for the Ph.D. do not appear to be overwhelming at present or likely to become so in the near future.

The concept of the Ph.D. as two years of graduate work beyond the Master's degree or three years beyond the Bachelor's degree (which we seem to have inherited from the physical sciences) is not an adequate basis for standards. Standards need to be defined in terms of measurable achievement, and these cannot be stated independently of program content. Nevertheless, those charged with administering graduate programs must have in mind some comparative criteria of achievement. These criteria are drawn from subjective experiences in their own graduate education, observation of graduates from other institutions, and comparison of post-degree performance of former students. The difficulties of this system become evident when a major change in theory, methodology, or need occurs, and most professors with more than a few years experience in graduate education have had to modify their criteria in response to such changes.

Course Programs

The individual backgrounds and needs of students, together with institutional differences among universities, make it difficult and perhaps undesirable to outline standard graduate programs. It is even more difficult to specify minimum requirements suitable for all students, and a certain amount of substitutability among various aspects of degree programs should be provided for. Therefore, the following discussion is stated largely in terms of desirable standards rather than minimum standards. The concept of minimum standard should be applied to the whole of a student's program, not to each of its parts.

Undergraduate Preparation

Undergraduate programs often are designed as terminal programs with little consideration given to preparation for graduate study. Since it is not reasonable to expect all holders of a Bachelor's degree to prepare adequately for graduate work, graduate programs should be designed to bring each student up to a desired level of competence rather than specifying an amount of work beyond the Bachelor's degree. In other words, the program should specify the total amount of course work and research required in various subjects, regardless of whether the work was done as part of the undergraduate program or not. Thus one student might require a year or more of "remedial" undergraduate course work and a full year of graduate course work, whereas another might require only half of the graduate courses normally expected in order to bring both up to the desired level of accomplishment.

Standards for graduate work cannot be achieved independently of undergraduate performance. There is a strong tendency for departments to pass the majority of their graduate students irrespective of their average level of ability. Consequently, one necessary means for maintaining graduate standards is through minimum entrance requirements. At the University of Alberta we require a minimum of 65 percent in the last two years of undergraduate work for admission to candidacy for the Master's degree.[8] In addition, we require an average of 70 percent for the required undergraduate courses in agricultural economics, economics, mathematics, and statistics, although students may be admitted on a probationary basis with averages between 65 and 70 percent. For admission as a provisional candidate for the Ph.D., an average of 75 percent in all required courses (undergraduate and Master's programs combined) is needed. We feel that these standards are adequate, workable, and desirable. The major difficulty is in applying these or any other standards to students who have taken their preparatory work in foreign universities. There seems to be no easy answer to the problem of evaluating foreign students' records, but we are considering a set of placement examinations which will aid in designing programs for such students after they have been admitted.

Economic Theory

An agricultural economist is basically an economist with emphasis on the application of economic analysis to a particular field or industry. Therefore, he should be well grounded in economic theory. The undergraduate preparation should include six credits of economic principles, six credits of micro-economic theory, and six credits of macro-economic

[8]The University of Alberta is shifting to a stanine marking system where the minimum passing grade in graduate courses is 6, and the maximum is 9. The admission requirement for graduate studies will be a 6.5 average for the last two years of undergraduate work. An average of 6.5 would be roughly equivalent to a grade point average of 3.0 where A = 4, B = 3, and C = 2. In terms of the letter grading system, the stanine marks convert roughly as follows: 9 = A+, 8 = A–, 7 = B+, and 6 = B–.

theory.[9] The Master's program should include an additional six hours of economic theory, preferably divided between micro-economics and macro-economics. The Master's student should achieve a level of competence in economic theory which will enable him to have a good general understanding of the economic system and the ability to apply theory in the analysis of practical problems and the evaluation of economic policy.

The Ph.D. program should take the student considerably beyond the Master's level in economic theory. Depending upon the nature of courses available, this may require 12 to 18 credits above the Master's level. The student's program should provide a basic understanding of monetary and fiscal theory as well as theory of firm, imperfect competition, consumer behavior, welfare economics, general equilibrium, national income analysis, and economic growth models. The doctoral student should not be expected to achieve a high level of creativity in economic theory, although he may do so in some aspect related to his special field in agricultural economics. However, he should achieve a thorough understanding of all aspects of economic theory, sufficient to be able to select and test theory for its application to agricultural economic problems and adequate to provide a foundation for assimilation of new economic theory concepts as they are developed. The desired level of competence in economic theory may come in part from applied economic courses (e.g., production economics), but the primary emphasis should be on pure theory courses.

Analytical Tools

The purpose of training in mathematics and statistics and their applications to economics is to provide a basis for a better understanding of economic relationships, to facilitate research and analysis, and to establish a foundation for continued learning as new techniques are developed and old ones improved. A substantial amount of training in quantitative tools is required for the Ph.D. in most universities. It is highly desirable that the quantitative training start as early in the student's career as possible to permit the use of quantitative techniques in advanced courses without having to waste time in such courses explaining the techniques used. Also it is preferable to have the basic mathematics and statistics taught by mathematicians in courses designed for social science students and to have the economic applications largely concentrated in quantitative economics courses. This procedure leaves other economics courses free to concentrate on economics subject matter. Quantitive courses should not be substituted for economic subject matter courses, but they should supplement and complement the theoretical and applied economics courses.

The undergraduate preparation should consist of about 18 credits in the quantitative field, including elementary calculus, difference and differ-

[9]One credit is roughly equivalent to one semester hour. A one-year course with three lecture hours per week would equal six credits. A half year or one-semester course with four lectures per week would equal four credits. Laboratory hours are not included in the computation for purposes of defining standards.

ential equations, linear algebra, probability and set theory, statistical theory and inference, and an economic statistics course covering multiple correlation and regression and time series analysis. Some training in computer programming, at least to the point of learning one of the more common compiler languages, should be included in the quantitative sequence or taken in addition. This sequence is heavier than is generally required of undergraduates in most institutions, but it is in line with the recent recommendations of special committees of both the Social Science Research Council and the Mathematical Association of America.[10] Both of these committees recognized the justification for new mathematics and statistical theory courses designed for students in the social sciences. A set of such courses recently was introduced at the University of Alberta, and we feel that this is a necessary first step in improving the mathematical training of economists.

The Master's program should include some six credits in quantitative techniques beyond those specified for the undergraduate preparation. This sequence should develop the application to agricultural economics of mathematical models, probability theory, statistical inference, mathematical programming, input-output analysis, production functions, and game theory. Problems of identifying demand and supply relationships, serial correlation, multicollinearity, and price analysis should be covered in at least an elementary manner. The courses should include practice in applying the techniques to economic problems.

The Ph.D. program should include an advanced course in mathematical economics and econometrics. In addition, an advanced calculus course and a statistical theory course would be highly desirable in lieu of a foreign language. The Ph.D. program should include 12 to 18 credits of advanced quantitative courses beyond the Master's degree requirements. Entering graduate students should be required to take the mathematics and statistics courses in which they are deficient during the first year of their graduate training.

The level of quantitative training recommended here is somewhat higher than is required in most American universities according to a recent study by Tolley and Grubb.[11] However, they reported that a majority of respondents favored mathematics as a tool subject for all graduate students, and there was divided opinion whether statistics should be included only as a tool subject or at a more fundamental level. Tolley and Grubb recommended substantial improvements in training related to quantitative techniques; their proposed standards generally were comparable to those

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[10]"Recommended Policies for the Mathematical Training of Social Scientists: Statement by a Committee of the Council," Social Science Research Council, *Items*, 9, June 1955, pp. 13-16; and "Tentative Recommendations for the Undergraduate Mathematics Program for Students in the Biological, Management and Social Sciences," Committee on the Undergraduate Program in Mathematics, American Mathematical Association (Berkeley, California).

[11]G. S. Tolley and H. W. Grubb, "Mathematics and Statistics in Graduate Agricultural Economics Training," *Journal of Farm Economics*, 47, May 1965, pp. 189-206.

recommended here.[12] Havlicek's suggested minima for Ph.D. students not specializing in quantitative techniques appear to be slightly higher in some respects than those recommended by Tolley and Grubb, particularly in the addition of specialized courses in econometrics and mathematical programming.[13] He recommended a total of 18 semester hours of quantitative courses beyond the Bachelor's level as compared with the 18 to 24 credits recommended here.

In the area of non-quantitative analytical tools an undergraduate course in logic and semantics would be highly desirable. A graduate course (3 credits) in research methodology, covering a brief introduction to the philosophy of science and the use of the scientific method in economics research, is desirable at the Master's level and should be mandatory for Ph.D. students. Such a course should stress the principles of scientific methodology as it applies to economics research rather than attempt to teach students "how to do" research. The latter can be learned more effectively by actual participation in research under the supervision of an experienced researcher.

The Special Field

The special field, defined as the field in which the student does his thesis research, should be adequately supported by specialized courses. Master's candidates should be encouraged *not* to overspecialize at the expense of breadth of training, and three to six credits of course work should be adequate in the special field. A thesis should be mandatory for the master's degree, whether the degree is terminal or preparation for the Ph.D. The experience in conducting guided research and in communicating a well-conceived and scientifically supported idea is invaluable to the student in any case.

The special field for the Ph.D. should involve penetration in depth into a particular area of study. The student should be expected to gain a thorough mastery of this field. The amount of course work required will depend upon the nature of the subject, its relation to the special field of the Master's degree, and the student's undergraduate preparation in the subject. Ordinarily six to 12 credits of course work might be required.

It probably is unwise for any department to offer specialized programs in very many fields. The number which can be handled adequately will

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[12]The recommendations for mathematics included "introduction to real variable theory and to theory of equations, matrix algebra, differential calculus, maximization of continuous functions and linear systems subject to constraints, and introduction to integrals, differential equations and difference equations," and the recommendations for statistics included a minimum of "strong introductory coverage of probability (discrete versus continuous probability; joint, marginal and conditional distributions; expectation and definition of mean and variance as expectations), with regression and variance explained in terms of probability concepts." Further recommendations were made for the inclusion of quantitative techniques in economic theory courses and the option of additional mathematics in lieu of a second foreign language. *Ibid.*, pp. 203 and 204.

[13]Joseph Havlicek, Jr. "Desirable Requirements for Graduate Students Not Specializing in Quantitative Techniques," *Journal of Farm Economics*, 47, Dec. 1965, pp. 1486-1496. Havlicek's mathematical recommendation includes "basic integral calculus, advanced differential calculus, linear algebra, difference equations, and differential equations." He recommended 6 semester hours of statistics at the graduate level and a 3 semester hour course in each of econometrics and mathematical programming.

depend upon the size and qualifications of the staff. Few departments have the breadth and depth necessary to offer specialized training in more than three fields. It seems highly desirable that each department concentrate on the development of one or two fields at the Ph.D. level. A department beginning a Ph.D. program would be well advised to start with one or possibly two specialized fields and add others only as experience is gained, staff is developed, and the demands for training warrant. A specialized field with only one or two students hardly justifies the considerable time and effort required to develop and teach first-rate advanced courses.

Supporting Fields or Courses

The entering graduate student should have a broad background in agricultural economics, sufficient to provide a basic understanding of the discipline as a whole. The undergraduate preparation should include courses in most of the major fields of agricultural economics, particularly farm management, marketing, prices, policy, land economics and world agriculture. In addition, the student should have some acquaintance with one or more of the other social sciences, especially rural sociology.

Supporting courses at the Master's level may or may not be concentrated in one field . The emphasis should be on breadth rather than depth. The nature of the special field, the student's interests, and the breadth of his undergraduate preparation will determine the nature of supporting courses needed.

The Ph.D. student should pursue one supporting field in depth, although he should not be restricted to supporting courses in only one field. The supporting field may be quantitative economics (the requirements for which would be additional to the general requirement in quantitative courses), another social science, or a field of economics, but preferably not a second agricultural economics field unless the department is particularly strong in that field. Ordinarily six to 12 credits of graduate level courses should be expected in the supporting field.

Other Requirements

Languages

The traditional requirement of knowledge of two languages other than English is gradually giving way as training needs in agricultural economics change. The reasons for the traditional requirements have been ably summarized by Eldon Smith:

> The classical view that strong emphasis must be placed on foreign languages, notably French and German, is based on two primary premises: that they have "cultural" or aesthetic value, and that the contributions of the European scholars are of primary importance in the field and would not be available to researchers unless they were able to read the languages.[14]

[14]Eldon D. Smith, "Foreign Language Requirements in Ph.D. Programs in Agricultural Economics", *Journal of Farm Economics*, 47, Aug. 1965, p. 529.

As Smith pointed out, much of the foreign contribution to economic literature now is published in English, and English translations of most classic works are available. Berelson questioned a number of recent recipients of doctoral degrees on their use of foreign language(s) in graduate training, in preparing the dissertation, and in subsequent professional work, and he received affirmative replies from only 19 percent of those who specialized in economics.[15] According to Berelson the foreign language requirement is widely regarded as a farce, and the typical means for meeting the requirement contribute nothing to cultural growth or linguistic understanding. He recommended that "the requirement should be set by each field — to the extent that knowledge of foreign languages is necessary for the conduct of research or scholarship in the field."[16]

Tolley and Grubb raised the central question concerning language requirements: "Do not other subjects ordinarily rank as high or higher than languages as marginal contributors to a student's breadth, depth or ability as a scholar?"[17] They answered their own question by proposing a secondary minor in mathematics as an option for the language requirement. Smith found that only a third of the American universities offering the Ph.D. in agricultural economics now require two languages with no alternatives, another third permit the substitution of a collateral field for the second language, and most of the remainder require only one language although a comprehensive level of knowledge generally is required.

The language requirement has largely outlived its usefulness and should be changed as quickly as possible. While a strong argument can be made in a bilingual country that a knowledge of both major languages is highly desirable, this is more appropriate as an elementary or secondary school requirement. Foreign students whose native language is not English certainly should be permitted to use English to meet the language requirement. It seems highly desirable that Ph.D. students in agricultural economics be required to substitute quantitative tools for one of the languages and that the remaining language requirement be made an option, subject to departmental discretion.

Communication Skills

One of the persistent myths of the academic profession is that good researchers are poor teachers and good teachers are poor researchers. Though there is some element of truth in the myth, and students who concentrate on learning to do research usually learn little about teaching techniques except by observation of their teachers, there is no reason why most people cannot become both good researchers and good teachers. Teaching and research are to a large extent complementary: teaching tends to become dull and dated unless it is supported by an inquiring mind and research experience in the subject taught; research results cannot be reported satisfactorily unless the researcher is skilled in communication.

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[15] *Loc. cit.* p .198.
[16] *Ibid.* pp. 240-241.
[17] *Loc. cit.* p .205.

Ph.D. students should receive some training in teaching methods, either through supervised classroom experience or an education course designed for university teaching, and preferably a combination of the two. There is a long-standing antipathy between academic professors and education professors; most of the former seem to feel that the latter can tell them little they do not already know about teaching methods. Perhaps we have jumped to a hasty conclusion, inasmuch as most of us know little about the actual content of education courses. It would be desirable for all Ph.D. students to take at least a short course in education designed for university teaching.

The graduate student's undergraduate preparation should include courses in both oral and written communication skills. In addition, seminar reports, essays, and term papers can serve a useful function in teaching communication skills, *provided that there is adequate feed-back to the student.* This feed-back should cover not only content, but grammar, form, and effectiveness of communication as well. One of the most common complaints from employers concerns the lack of communication ability of university graduates. Our performance in this area is one of the weakest parts of both undergraduate and graduate training. The most immediate solution would be the requirement of more oral and written reports with detailed criticisms returned to the student.

Research and Theses

Experience in carefully supervised research is an essential part of the graduate student's training at both the Master's and the Ph.D. level. Master's students should not be expected to make an original contribution to the field; instead, the research should be primarily an exercise in the use of the scientific method and the application of analytical tools. Preferably the Master's student should be provided with data by his supervisor, from either secondary sources or special surveys. The student's limited time is most productively spent on analysis and writing. The thesis should be short, concise, and well-written. The supervisor should avoid "writing" the thesis through overly specific suggestions, and he should recognize that the inexperienced thesis writer tends to be overly-suggestive and is too easily discouraged from developing his own style of communication.

The Ph.D. research project should be a major scientific investigation, although sufficiently narrow in scope to be manageable and to avoid unduly prolonging the completion. The student should be expected to design and carry out the study, select the appropriate theoretical framework and analytical tools, and write a report of publishable standards. The thesis should demonstrate the student's comprehensive knowledge of the theory relevant to his subject and his ability to apply and test theoretical concepts. The classical notion that the Ph.D. thesis must make a fundamental contribution to knowledge and be publishable (or published) as a book has been inappropriate for some time. The sheer number of Ph.D.

Table I
A Desirable Undergraduate Curriculum Prerequisite To Graduate Work in Agricultural Economics

Credits*	Preferred Subjects
18– 24	Economic principles, macro- and micro-economic theory, public finance or money and banking
18– 24	Agricultural finance, marketing, policy, prices, farm management, land economics, world agriculture
6– 12	Social sciences, including rural sociology
9– 12	Elementary calculus, difference and differential equations, linear algebra
9– 12	Probability and set theory, statistical theory and inference, applied economic statistics, computer programming
6– 12	Humanities, including English
12– 18	Biological sciences
12– 18	Agricultural sciences
120–132	Total

*Credit units are measured in terms of hours of lecture per week per term (half year), laboratory hours ignored. For example, a course with 3 hours of lecture per week for an academic year would count as 6 credits.

theses makes it highly improbable that many can make fundamental contributions. Also the book type thesis has passed out of style in favor of a more concise report. It is generally desirable that the thesis deal in depth with a single theme and that it be presented in good style and form. It would be desirable further that the thesis be easily condensed and publishable as a journal article or short monograph.

Summary of Requirements

Undergraduate Preparation

The diversity of training goals in undergraduate training in agricultural economics makes it difficult to design programs ideally suited as preparation for graduate work. Many students change their goals during the course of their undergraduate careers and decide to undertake graduate work without adequate preparation. The undergraduate training should include substantial preparation in general economics, agricultural economics, other social sciences, mathematics, statistics, humanities, biological sciences, and agricultural sciences (Table 1). This preparation should equip the student with a broad general understanding of agriculture and its economic problems as well as provide a sound foundation for further academic development.

TABLE 2
A DESIRABLE GRADUATE CURRICULUM FOR THE M.SC. DEGREE IN AGRICULTURAL ECONOMICS

Credits	Preferred Subjects
3– 6	Field of specialization
6– 9	Supporting courses
6	Economic theory
6 - 9	Analytical tools
24	Total

Master's Program

The Master's degree should be conceived and developed as a respectable degree in its own right — *not* as a fifth year of course work or an apology for failure to qualify for the Ph.D. The Master's program should not be overly specialized, but it should develop the student's understanding of economic theory, his special field, supporting subjects, and analytical tools (Table 2). Most students come unprepared for graduate work, and they should be required to clear all undergraduate deficiencies before admission to full candidacy for the degree. Thus most students can expect to take two calendar years to complete the requirements for the degree. The oral examination should be designed to test the candidate's overall competence in agricultural economics with emphasis on the level of achievement in the special field.

Ph.D. Program

The Ph.D. degree should be conceived basically as a degree in economics with emphasis on its applications to agriculture. The student should be expected to achieve a high level of competence in at least four and preferably five fields, including the special field, a supporting field, macroeconomics, microeconomics, and analytical tools (Table 3). The course

TABLE 3
A DESIRABLE GRADUATE CURRICULUM FOR THE PH.D. DEGREE IN AGRICULTURAL ECONOMICS*

Credits	Preferred Subjects
6–12	Field of specialization
6–12	Supporting field
6–12	Macro-economic theory
6–12	Micro-economic theory
6–12	Analytical tools
6–12	Advanced mathematics and statistics in lieu of language
48–60	Total

*The course program is defined in terms of the total graduate program, including courses taken for the Master's degree.

recommendations should be interpreted in terms of a desirable level of achievement rather than formal course requirements. The level of achievement in each of the four or five fields should be defined in terms of a comprehensive examination, and the course program for each student should be tailored to bring him up to the desired level of achievement. Major stress should be placed on theoretical content, *even* in the applied fields, because students at the Ph.D. level should have taken all of the strictly applied courses necessary or desirable before entering the program.

Concluding Remarks

There is a critical need for redefining the purposes of graduate degrees and establishing better and more uniform standards for graduate programs. The improvement of standards requires better undergraduate preparation, more adequate graduate admission criteria, more appropriate program content, and greater emphasis on the levels of achievement required for graduate degrees. The Master's degree especially needs reinstatement as a respectable academic and professional degree. The expected rapid increase in demand for graduate study makes it imperative that standards be firmly established before they become eroded further by the pressures of increasing numbers of students.

EXHIBIT 2

SOME PROBLEMS AND CHALLENGES IN AGRICULTURAL EDUCATION*

Agricultural Economics can be considered an established department at the University of Alberta. In five years since it was established, it has grown rapidly in staff, students, research, and adult education activities. It has become one of the major departments in the Faculty of Agriculture and it has established a firm foundation for future development. The struggle to become established has been long and arduous. We have concentrated largely on building our foundation and we now need to shift our attention to other dimensions of development.

It is time that we evaluated the progress we have made, examine our goals, and choose new directions. While the department has been struggling with its infancy, other things have changed -- the needs of agriculture, the environment of the University, the concepts of people, and relevant government programs. We members of the staff tend to become somewhat blinded by the press of everyday problems upon us. We have great difficulty in standing aside and taking an objective view of our situation -- in this we need your help.

Tomorrow we shall present a more detailed review of our progress, outline some of our problem areas, and seek your help in establishing new guidelines. Tonight, we wish to set the stage for that evaluation by discussing some of the broader aspects of agricultural education within which we operate. The development of our field of activity must take place within the framework of the institutions and working relations of agricultural and university education in general. And it may be that some of the things we

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* by Travis W. Manning, Professor and Head, Department of Agricultural Economics. Presented to the Agricultural Economics Advisory Committee, Red Deer, April 5, 1966.

need to do will require changes in the institutional framework.

The Agricultural Economics Advisory Committee was a critical factor in the early development of the department. Without your help, we might still be struggling to get through the starting gate. You have done your job well and the department, the university, and the province owe you much. While we no longer need help in becoming established, we hope you will play an even more vital role in our future development. We need your continuing counsel and assistance if we are to achieve the many things which need to be done. Tomorrow, we will discuss with you a new role and relationship which we hope you will find challenging and personally satisfying. Now, we want to share some ideas and thoughts with you which we hope will stimulate some interesting discussion.

The Changing Role of Agricultural Education

Agricultural education at the college level began to develop in North America about a century ago. Agricultural colleges were established -- sometimes separately and sometimes in conjunction with existing universities -- for the purpose of developing and communicating knowledge about farming. The earliest courses and research efforts -- to the horror of the classical scholars -- were directed toward the most practical aspects of agriculture. The first agricultural professors had little to build on -- they used what scientific principles they knew and they learned farm problems by experiencing them.

The early agricultural teachers soon discovered that the existing stage of scientific knowledge was inadequate for their purposes and they began to embark upon scientific researches of their own. In

fact, a great many scientific discoveries were made by these men seeking knowledge for the solving of practical problems. However, the seeds of dissention were soon laid for the development of two camps -- the practical agriculturist versus the scientific agriculturist. As we have seen, the scientific group won out, the practical agriculturist could not keep pace with the rapid development of technology, and scientific knowledge. However, the issue refused to die a graceful demise and it rose again at another place. The newer issue involves applied science versus fundamental science. While this issue is somewhat semantic and each side has a definite place, a more real issue exists between those who see science serving agriculture (the problem solving orientation) and those who see science for the sake of discovery (the basic research orientation). Hopefully, this issue too will fade with time. But its relevance here is the changing nature and emphasis of science in agricultural education. The important questions are how the scientific activity relates to agricultural problems and how communication is maintained between the people who have the problems and those who do the research.

A more recent development on the agricultural education scene -- and again a contentious one -- concerns the business and social sides of agriculture and rural life. The traditional agriculturist dealt with things -- soils, plants, animals, chemicals, and machines. People were generally not his concern. Even the work in farm management originally had a non-social orientation. Farm management became interested in the manager himself only comparatively recently. The concept of "farm and home planning" is even more recent. Agricultural economics and its

sister discipline, rural sociology, have slowly gained acceptance in the agricultural fraternity. Farmers seem to have become aware of the need for these fields before many people in universities did. Some academicians still question the virtue of economic and social training and research in agriculture.

The future roles of various disciplines and institutions in agricultural education are not easy to foresee. While we may be prejudiced, we believe that the social sciences will play an increasingly important role. More people are becoming aware of the need for research, training, and action programs in the social science fields. As our society continues to become more urbanized, the lines between agricultural and urban life become less distinct. As agriculture becomes more mechanized and more activities move from farms to factories, farmers become more like other business men. While the processes of urbanization, mechanization, and automation create problems, they bring about profound changes in the nature of society and its need for education services.

The emerging needs in agricultural education are not always easy to recognize but some of the more obvious ones are (1) education of rural youth for a place in modern urban society, (2) solving the problems of rural poverty, and (3) planning for economic growth and development. We foresee that we will be called upon increasingly to work on such problems not only here but in the developing nations abroad. Being plainsmen, we are possibly more insular and less conscious of the problems of low-income countries. However, we are rapidly becoming aware of these problems and we have the knowledge, the resources, and the will to do something about them.

Responsibilities for Agricultural Education

Agricultural education may be divided into a number of categories. Basically, we think of education as the discovery and communication of knowledge. The discovery phase may be subdivided into basic, fundamental, applied, and problem oriented research, although there are no distinct boundaries between them. The communication phase may be subidivided into highschool, undergraduate and graduate teaching programs on the one hand and various types of adult education programs on the other. The latter include short courses, conferences, workshops, field days, and other extension activities.

The responsibilities for the various agricultural education roles in Alberta are divided between the federal government, provincial government, university, and other organizations. There are neither clearcut boundaries of responsibility nor effective coordination among the agencies and organizations engaged in agricultural education. The following chart describes in a general way the way responsibilities are divided.

The Canada Department of Agriculture has the major responsibility for agricultural research in Canada and it controls more than half of the funds expended on agricultural research. It operates four experiment stations in Alberta, none of which are associated with the university. Additional research is carried out through the P.F.R.A., federal members of the Alberta Soil Survey stationed at the university, and the Economic Branch in Edmonton. The Economics Branch offices are being consolidated at Regina. However, we expect to have one or more of their people stationed with us and working on cooperative research projects

with members of our department.

The Alberta Department of Agriculture has major responsibilities in several areas. Through the Agricultural and Vocational Colleges, they offer both farm and technical training to rural youth. These schools appear to be becoming less and less closely associated with the Faculty of Agriculture. However, they seem to be moving positively to supplying some very real training needs for rural people. The magnitude of the needs probably is much greater than the three existing schools can accommodate. Without speculating alternative solutions, it does seem appropriate to ask what role the University should play in expanding educational opportunities to rural youth. The A.D.A. also carries out research activities in some areas, particularly in agricultural economics and rural sociology. Most of these activities are associated with program development but there has been a trend toward becoming involved in major research programs.

Perhaps the major educational role of the A.D.A. is in adult education. The Extension Branch has representatives in all agricultural areas of the province. They are engaged in the final step of agricultural education -- carrying knowledge directly to farmers and homemakers. Backing up the field representatives are a number of extension specialists. The A.D.A. is establishing six regional extension offices throughout the province in order that the specialists may work more directly with farm people. As farming has become increasingly technical, district extension agents have become less able to be expert in all fields. The agents have become program organizers and contact men to bring the specialist and the farmer together.

The primary roles of the University in agricultural education are research and teaching at the undergraduate and graduate levels. University research is largely of the fundamental variety and much of it lacks a program or specific problem orientation. The newly formed Agricultural Research Trust, which has been endowed with $500,000 for the Alberta government, should help greatly in bringing about a better balance to our research program. The University also plays an important but comparatively small role in adult education. This role is carried out through the Extension Department, cooperation with the A.D.A., and direct programs by departments and individual staff members. None of these are working as satisfactorily as might be wished, largely because of a lack of organization and philosophy on the part of the University and inadequate cooperation between the university staff and the A.D.A. An important constraint on the adult education activities of university staff is the absence of an organized program and the small amount of credit given to such activities. Faculty members generally are expected to teach the same number of courses and make the same amount of progress in research regardless of the extent to which they engage in adult education activities.

Agricultural education activities also are carried out by a large number of other agencies and organizations. Some of these have sprung, no doubt, from dissatisfactions with existing programs. Perhaps if the major agencies were doing a more thorough job, many of them would not be needed. In any case, better communication among the various groups seems desirable.

Integration - Coordination - Improvement

There are arguments both for and against an integrated agricultural education system and it is not my purpose to argue the case. However, some of the disturbing features of the present system should be noted. The absence of integration in agricultural research results in considerable difficulty in program planning and achieving the best use of scarce manpower and financial resources. Even with the best of intentions and goodwill, it is difficult to coordinate the activities of six research stations operated under their separate administrations. Responsiveness to new needs probably is inhibited by this lack of central organization.

There also are pros and cons regarding the adult education role of university staff. It is difficult to integrate this role with classroom teaching in particular because of the competing demands for time. However, the absence of a well defined adult education role tends to divorce the university staff from their constituents -- the farming public. The present system makes it difficult for university researchers to communicate their findings to farmers. Perhaps more important is the lack of communication from farmers to the university staff.

Better coordination of agricultural education obviously is needed. Whether or not this is a sufficient condition for improving the situation is questionable. This question must be resolved by people such as you, not by the public servants involved.

EXHIBIT 3

EDUCATION FOR AGRICULTURE

Teaching *

Formal education takes various forms. So far as agriculture is concerned we in Alberta are mainly concerned with education through the schools of agriculture and education through the university. Adult education through the University Department of Extension and through the Provincial Extension service may be important, but here I shall be concerned only with formal types of education. Since these institutions, particularly the university and the schools of agriculture, may be modified if they are not doing the job required we should occasionly examine them in the light of our purpose to determine if changes are needed.

Before considering whether our institutions are satisfactory it is appropriate to consider what we want of them. Possibly we could agree that education for agriculture should involve one or more of the following:

(1) Training of persons from rural or urban areas for work in primary or secondary agriculture.

(2) Training of persons raised and sometimes experienced in primary agriculture for work outside of agriculture.

(3) Although it sounds clichéd, training for life, pleasure, and democracy of persons coming out of, or going into primary agriculture.

In the terms suggested here agriculture is not the same as farming, but includes farm supply as well as farm product, processing and marketing. Moreover, farm people are not the same as rural people.

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* G.R. Winter Presented to the Advisory Committee, Department of Agriculture Economics, April 5th, 1966.

With the previous purposes in mind consider the dimensions of the problem of education. First some 23% of the people in Alberta live on farms. Their children must be educated. Second, there are some 70,000 farms in Alberta, and given a productive life of 40 years, and even allowing for an annual decrease of 1,200 farmers per year (as in the past five years) we need to train some 70,000 divided by 40 minus 1,200 equal 1,750 minus 1,200 equal 550 farmers per year.

We can look at the need for training in a different fashion. There are some 2 1/3 to 3 non-farm agricultural jobs available for every farm. Thus, agricultural employment in Alberta must be in the order of 73,000 times 3 1/2 equal a quarter of a million persons. But suppose we confine are attentions to occupations closely related to primary agriculture, suppose we assume there is only one off-farm-job for every farm job. Then, agricultural employment in Alberta would be some 146,000 persons. How many of these need agricultural training? In the Canadian economy as a whole some 16% of the labour force is professional or managerial. It seems appropriate to argue that the professional and managerial class should all be educated in some formal way respecting their occupation. Thus, we should in Alberta need to train some 146,000 divided by 40 times 0.16 persons per year which is equal to 554 person per year.

It can be appreciated that these calculations are extremely rough and ready. But, in fact, they are given to you just the way they were made without alteration and modification to correspond one with the other.

It might be argued that this figure of 554 person per year places undue stress on education. Is this a typical educators comment? In fact, it seems virtually certain that the returns to funds invested in education will be much higher than funds invested in almostany other agricultural persuit. If we take the rate of return on farms in various districts of Alberta as indicated

by the 1964 Farm Business Report we obtain the following table:

TABLE I.

RETURNS TO CAPITAL INVESTED IN AGRICULTURE

Region	Percent return
Peace River	4.3
Wainwright Vermilion Coronation	2.9
Camrose Leduc Wetaskiwin	1.3
Irrigation Districts	5.5
Olds Red Deer Lacombe	5.4
Vulcan Strathmore	9.7
Sturgeon Strathcona	2.9
Calgary Drumheller High River	5.3
Barrhead Westlock Mayerthorpe	6.4

Unweighted Average 4.9%

These rates of return are relatively low as is well known. Returns for the majority of business in 1964 might be expected to be in the order of nine or ten percent so that farming yields a relatively low

return on investment in capital.

Quite the reverse is true of an investment in education, a fact, many studies have confirmed. It is perhaps typical to compare the private returns to an individual of investment in education when the investment is measured in total dollar amount whether expended by society, by the individual, or attributable to foregone income. The difference between returns on private expenditure and returns on public expenditure can be substantial as Table II shows:

TABLE II

RETURNS ON PRIVATE AND PUBLIC EXPENDITURE IN ISRAEL

Profession	Returns on Private Expenditure	Returns on Public Expenditure
Engineers self-employed	30%	14%
Lawyers	25%	20%
Physicians on salary	25%	
Physicians self-employed		3%

T. W. Schultz of Chicago, after an extensive survey, concludes: "The 1958 data appear to support the following rates of return", elementary, 35%; high school 10%; and college 11%." It appears that the rate of return increases then declines with additional years learning. "Hanson's estimates

for males, 1949, shows that the marginal rate of return rises rapidly from the completion of the first two years to the completion of the seventh and eighth years of schooling, from a rate of about nine to twenty-nine percent. This marginal rate of return then declines for high school and colleges; the eleventh and twelfth year of schooling shows a return of nearly 14% and the fifteenth and sixteenth year a strong 15%. (These are internal rates of return and do not take into consideration the effect on society of a well educated populace.)" Gisser's study implies a high rate of return to schooling even for hired farm workers in the United States, a finding which comes as a surprise".*

SUPPLY OF AGRICULTURE GRADUATES

From the time of the first agriculture graduate from the University of Alberta in 1918 until 1965 with exception of the war years the graduating class in agriculture was almost always between 10 and 30. The 1966 graduating class is expected to be in the order of 50 and the 1969 graduating class in the order of 85. Figure 1 shows the graduating class in agriculture between 1918 and 1965. A simple trend line indicates the class size to be doubling every 25 years. Figure 2 indicates the size of the graduating class in agriculture from the schools of agriculture in Alberta over virtually the same period as Figure 1. The number of graduates ranged with some exceptions between 100 and 200. There is of course considerable double counting involved in these figures as many of the graduates from the university, particularly in the early years, were graduates from the schools of agriculture as well. The point to be made is that there appears to be

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* Pages 62 and 63.
Schultz, T.W., The Economic Value of Education, Columbia 1963.

available some 100 to 200 graduates, or perhaps a little more, per year in agriculture in the Province of Alberta.

We have argued that there is a need for some 500 graduates per year and show that there is available only some 100 to 200 graduates per year. In more recent years there has been available some 250 graduates per year, but this is still only roughly half as many as are needed.

DIAGNOSIS OF FAILURE

There are three possible reasons why relatively few graduates in agriculture find employment in Alberta. These are: (1) The product is wrong (the graduate himself is not appropriately trained for the needs of the time); (2) Salesmanship has been inadequate and defective; (3) The agrarian philosophy of farm people in Alberta has resisted utilizing formal education. There may be several other reasons but it seems to me the major defect must lie with some combination of the above three.

It seems possible that the product has not been appropriate in Alberta. The Bachelor of Science graduates in Agriculture are trained to a modest level in science but they are inadequately trained as scientists and are virtually untrained in practical affairs. The graduates in the school of agriculture on the other hand appear to be excessively trained in practical techniques of primary agriculture and have relatively little knowledge of scientific procedures.

Unquestionably the Faculty of Agriculture at the university has not thought of its task as involving or including the sales of its primary product namely an educated agriculture student. Very little effort has been devoted to that type of activity. My impression is that the same

may be said about the schools of agriculture.

The agrarian philosophy in turn derives its roots from the family farm tradition and the tradition of aloofness, independence, and straight-forward honesty. Unfortunately, any philosophical school, because it involves belief stands opposed to education which involves learning a questioning attitude. We educators can't work with closed minds so we have to challenge preconceptions and destroy 'sacred cows'. When this is done people start to think. They may come back to the beliefs they held before, but this time they will know why they held those opinions and will know under what circumstances those opinions will be abandoned. A good educator is explicitly or implicitly iconoclastic. Is this why agrarian people have avoided education?

SUMMARY

The educated agriculture student is a good product but an expensive one. Purchase of an educated is involves a high payoff but only in the long term and after a good deal of effort. The educated individual will have a rich life, but many persons will not be sufficiently hard working or brave to undertake the task. Alberta is educating and employing only half as many students of Agriculture as seems appropriate.

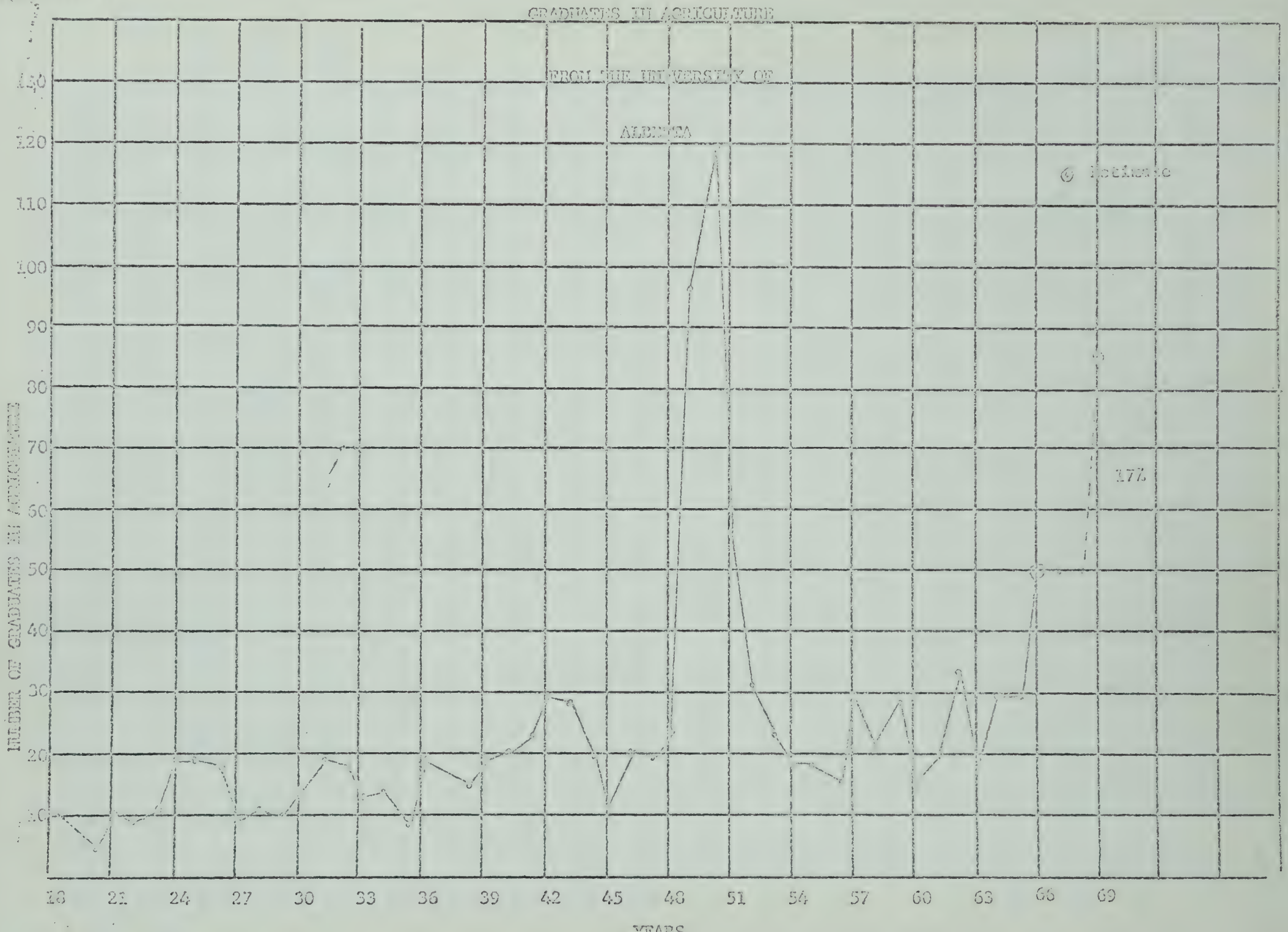
GRADUATES IN AGRICULTURE
FROM THE UNIVERSITY OF
ALBERTA
Science
17%
NUMBER OF GRADUATES IN AGRICULTURE
140
120
110
100
90
80
70
60
50
40
30
20
10
18
21
24
27
30
33
36
39
42
45
48
51
54
57
60
63
66
69
YEARS

Figure No. 2.

GRADUATES IN AGRICULTURE FROM SCHOOLS OF AGRICULTURE

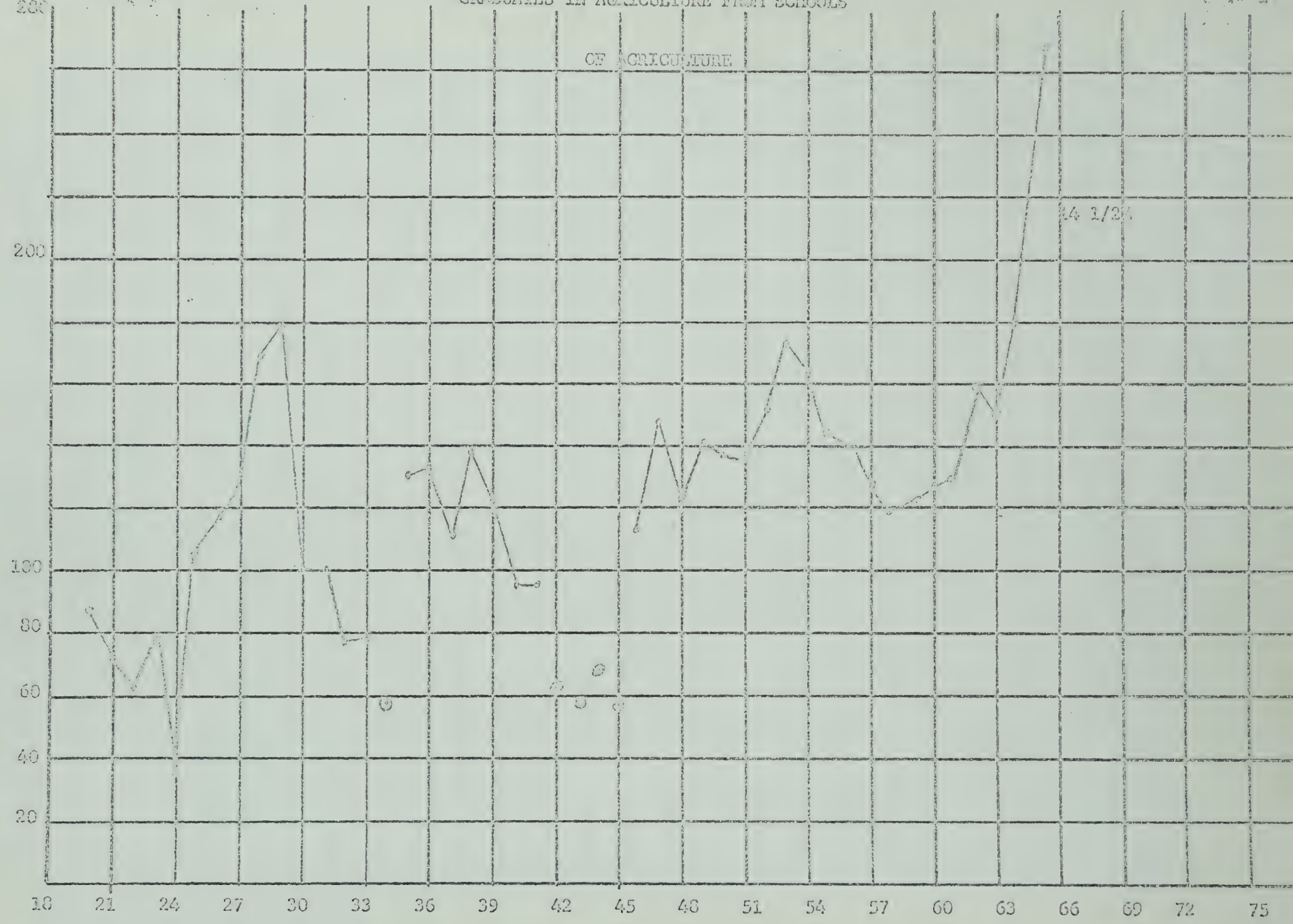

EXHIBIT 4

Changing Roles and Responsibilities in Agricultural Education

Considering Adult Education or Extension

Harold C. Love[1]

Introduction

Changes which are occurring in commercial agriculture and in the farming community generally provide clues to the type of lifelong learning programs which will be most useful in the future. When measured over a period of 10 years the growth of farm size in Alberta is fairly dramatic. That is one to three farms out of each 100 change ownership each year. In two thirds of the sales farm consolidation is occurring. For example in 1956 79,424 farms were counted by the census of Agriculture. In the census of 1966 a prediction of 64 or 65 thousand farms is made based on the amount of farm consolidation observed in the 1966 Feature Study Survey sample. From this change in farm numbers, despite of some homestead activity largely in the Peace River area, we conclude that the farm family clientele interested in new findings from research stemming from our universities and Research Stations will continue to decline. Yet the size of our productive agricultural plant as measured in output is increasing. Hence the need for continued lifelong learning on the part of those engaged in commercial agriculture becomes more intense with each passing year. On a percentage basis the number of innovators and early adopters of new production practices is increasing within the agricultural population. Except in the short run there is no such thing as "business as usual" in agriculture. The competition for land, machinery and purchased farm used in

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1 Professor of Agricultural Economics. Presented at annual meeting of Advisory Committee April 5, 1966, Red Deer, Alberta.

production increases each year as capital is substituted for labor in the on-farm-production. Observation indicates that the innovators in agriculture tend to by-pass the district agriculturist and seek out the research scientist at the university or research station. Innovators are regular readers of more technical and scientific bulletins and journals than are the early adopters or median adopters of new technology. As capital requirements for farming rise, the risk of making a wrong decision has a higher penalty attached. By analogy agriculture has moved to the jet age from the age of the model T Ford and in making the transition lost some of the time flexibility and tolerance for error in decision. The use of computers for linear programming in the farm business will in the next decade be as commonly used by, at least the leading farmers, as is electricity, television, and radio today.

The Unfriendly Market

In a sense agricultural production has become urbanized in that it has acquired the characteristics of the large city business firm with higher capital requirements and perhaps lower expected profits per unit of production. For example the use of expensive machinery requires a large volume of production over which to spread the high fixed costs. Managerial institutions in agriculture are put to a very stern test by yet another force. The demand for farm products at the farm does not contain the resiliency it once did. Resiliency is lost because consumers are becoming more rigid in their demands. Too many services intervene between the farmer and consumer and some of the elasticity that remains at the consumer end is not fully transmitted back to farm level demand.

Furthermore, the market is unfriendly in still another way. It is presenting demands upon the farmer of an exactness not known in an older time. To great

extent the change results from needs in mass handling, as processors and large wholesalers and retailers now choose to buy and sell farm products by specification. Hence, the over all effect is one of impatience and penalty for the unreliability and unpredictability with which farm products are supplied to the market.

Economists have recognized that the production side of agriculture has gained increasing prominence and importance. This is reflected in ten years of insistent calls for more supply-response research. Certainly during the last five years some research of significance has been made. For example Marc Nerlove's analysis of farmer psychology in distributed lags is one of the more interesting outcomes. Significantly it presupposes that a readily manageable responsiveness exists. Thus if the market forces are judged unfriendly by standards of the past what alternatives are faced by farmer producers?

The Courses of Action

The kind of adult education or lifelong learning needed in the years ahead is in part contingent on what may be referred to as the institutional developments or courses of action which are available to farmers in the environment of an unfriendly market. Perhaps three choices essentially continue the present organization -- two others are more revisionary. They are: (1) to retain the traditional organization with a minimum of change and the assurance of a stepped up educational program; (2) retain the traditional organization aided by highly developed forms of cooperation; (3) to retain the traditional forms of organization through the mechanism of government production-control and/or price support programs; (4) to combine horizontally,

changing to large-scale industrial forms of organization marked by a high degree of specialization and professional management, and (5) to integrate vertically transferring management entirely off the farm by putting it in the hands of non-farm agents. These are likely to be the farm suppliers-processors or credit institutions. Criteria for choices among these alternatives can be detailed only briefly together with their implications for the kinds of lifelong learning programs needed. We may inquire which plan of action will be publicly acceptable and meet such standards as:

(1) a capacity to attain stability of output and physical efficiency;

(2) attain equity of return to land, labor, capital and management within agriculture;

(3) attain the political and cultural values involved in conformity to the public interest.

In considering the choices of action and their criteria we need to lift our sights and ask what kind of a world do we want to live in. Agriculture is an important part of that world. Associated with criteria (2) the attainment of equity of return to land, labor, capital and management is the structural problem of how valuation is to take place, either in traditional family-farm agriculture or in a more radical change that would surplant horizontal market exchange with a vertical nonmarket system. The changing roles and responsibilities in agricultural education with respect to continuing adult education or what I choose to call lifelong learning must be cast within the framework of the predicted or most likely course of action or trend in the institutions or structures of agriculture.

Two types of agricultural settlement patterns are in progress. Production of irrigated high value crops cause farm consolidation to be slow. Indeed, the development of new irrigation acreage may actually bring about an increase in farm employed people in certain counties or municipal districts. In such areas

adult education or extension work requires extensive knowledge of specialty crops, irrigation land management and product marketing. One district agriculturist cannot be an expert in all these fields. Perhaps two or three specially trained persons are needed in such areas to provide guidance which will maximize income from the ever increasing input of resources. In such areas emphasis on production and marketing must be in the hands of specialists whether they are stationed in the area on hand at a central point such as near a university or research station. Such specialists must keep abreast of the latest research findings. Significantly the specialty crops often enjoy a high price elasticity of demand, hence their production can absorb added inputs and return a profit.

The second type of settlement pattern is more general throughout the province and is characterized by the urbanization of agriculture. Farm consolidation causes a decline in the rural population. More over there is some tendency for the larger farm operators to live in towns where schools, churches and social activities are readily accessible and retain only minimal labor on the farm on a year around basis. Such operators are commuters. This decline in rural population causes the cost of social services such as schools, roads, health facilities and extension work to increase on a per capita basis. Such a trend may require only one district agriculturist where two had formerly been employed. On the other hand the educational training offered must be in greater depth again causing the employment of specialists to increase.

Certainly if any of the first three alternatives in agriculture are anticipated in the future the need for a greater number of specialists and a smaller number of district agriculturists is likely to be the desirable pattern in adult education. The housing of extension specialists with the departments of their appropriate disciplines at the university is highly desirable. How such an arrangement could be accomplished in Alberta is in the hands of agricultural leaders. The policy adjustments needed to bring about such a change in this

year: under examination by the Alberta Institute of Agriculture. Implementation of such policies are beyond the scope of the assigned topic.

EXHIBIT 5

Changing Requirements, Roles and Responsibilities

In Agricultural Education

RESEARCH ORIENTATIONS

W. M. Schultz

Knowledge of farming comes from several sources, like

received customs, habits and traditions,

experienced observation,

analysis and monitoring of accounts,

formal controlled research,

and incidental sources.

It is at once sobering and challenging to the researcher to know that he is expendable. This chilling thought is somewhat tempered by the observation that people usually call for research when all the other sources of knowledge have failed, give no readings at all, or only weak or contradictory ones.

Yes, research is a long-shot gamble. Its results are less certain as we move from development research, to applied research, to foundations research, even though the potential payoff increases in the same sequence.

As an economist who believes in the fundamental rationality of people's behaviour, I observe that foundations, problem-oriented and development research are carried on, side by side, and I conclude that a certain amount of each is considered worthwhile from the viewpoint of our society in particular and mankind in general. Unfortunately such a general conviction does not tell us how much to invest in a particular piece of research at any given time.

Prepared for the Agricultural Economics Advisory Committee Meeting, April 5th and 6th, 1[illegible] Red Deer, Alberta.

Lord Snow, who is one of Britains elder statesmen of the scientific establishment, a scientist, popular novelist, and politician, a man dearly loved by Anglo-Saxon scientists on both sides of the Atlantic, observed this only a few months ago:

> "Allocating ... between national topics is quite another matter. In fact, though not necessarily in form, all countries rely on the judgements of eminent scientists. And these eminent scientists, in any country, are the first to say that the job contains only a modest element of reason. You watch what other countries are doing and fill the gaps; you rely on a man (or a group) who knows what he wants; you are influenced, as we all are, by the scientific fashions of the time; you even back a hunch. I am not using the stately language of official reports." 1

So, once we have gone beyond the stately pretences of official reports, what is our situation?

During the lifetime of the generation of agricultural leaders whose heritage of wisdom the present generation is now taking over and augmenting a fundamental change has occurred in the attitude towards research. To quote one of them:

> "When I started in farm management work, my training led me to believe it was my duty to analyze a situation and make a recommendation to the farmer as to what he should do. I think many farmers still would like this... However, it is now my strong belief that our job is to identify clearly the problem for the farmer, set forth the alternatives and then to analyze the consequences of each for him in order that he can make his decision intelligently. Our real contribution is to put the problem in its proper decision making framework, to provide the quantitative data relative to the factors involved when ... available, and to flag the farmer on the items which should be considered when quantitative data is not available."2

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[1] Snow, C.P., "Government, Science, and Public Policy", Science 151:650-653, (11 February, 1966).

[2] Rottum, J. Carroll, "What are the management educational needs of our clientele?", Proceedings of the North Central Farm Management Extension Workshop, Purdue University, May 8-10, 1967.

The change in the attitude of agriculturalists to which this man is testifying has been caused not so much by a shift in the basic nature of the clientele -- the farmers, but by a change in circumstances. We have progressed from the days of dire necessity, and hand-to-mouth policy towards information, which had to be followed in order to secure the bare existence on farming units that were small, required unending physical drudgery in return for a small and uncertain payoff, located in a region which had never before been exploited with the plow, the drill, and the domesticated grazing animal. No longer is the knowledge problem one of pure survival in the physical sense. It has become a matter of exploiting the fine differences of location, of pressing for changes in the economic organization, of adapting to technological developments, starting from a more or less secure base of existence.

We are still debating the survival of farms as economic units. But that is a long way from the survival of the farmer and his family which was the question that mattered during the pioneering period. We wish to move from one level of economic well-being and status to a higher one, but that is a different problem than the problem of finding ground under our feet.

This change in the situation and the attitude of farmers and of those whose business it is to acquaint farmers with the best of current knowledge in farming, has meant a change in the attitude of the researcher. Because it is no longer sufficient to paint the crude outlines of farming here, or in the grey wooded soils area, or the foothills, or the Palliser triangle; it is no longer sufficient to present a case study of a group of farms and say: do as the best are doing. It is an oversimplification to tell farmers: use antibiotics on your calves, because they will eat more and grow faster. There are qualifications

that potential users must know, and possibly before they find out through their pocketbook what they have to watch when using the stuff. The same is true for high-powered tractors, high-powered crop varieties, types and formulations of fertilizers, irrigation layout, vegetable farming, etc.

Greater specialization in research has developed to satisfy real needs. Research in depth has developed in response to specific questions that crop up with more sophisticated technology and closer ties of the farm and the rest of the economy. Some of the disadvantages of specialization have been overcome by specialization on a wide front and exchange of new knowledge across boundaries of provinces and countries.

The avalanche of new research knowledge, which often reaches the farmer in crude form, unrefined by the application of selection and local adaptation, presents quite a challenge to the farmer.

The avalanche of new information forces the farmer who wants to remain in the game to devote more and more time to the job of information processing: to winnow the chaff from the wheat, he scans farm papers, dailies, bulletins, radio, television, books, manufacturers' blurbs, the spiels of machinery dealers and fertilizer salesmen, the rhetorics of politicians. The winnowing calls for independent judgement.

Faced with a problem people have a habit of calling for more research. I agree that the "information explosion" requires massive efforts to stay on top of it. The winnowing job somehow must be made more independant of chance and luck. I am strongly convinced that we must dig in and search for the answers that we can perceive only dimly at the present time. It is high time we start paying more than lip service to the universal principle of feedback. The notion of feedback is simple enough. We all use it, when we "learn from experience". A feed-

back system is any setup where the outcome of a process or the result of an action is monitored or measured and the measurements used to control the process or action to maintain it at a desired level or get the desired results. The use of feedback loops is so universal that it appears almost trivial to us. But it is an achievement of the first order to clearly state the universal nature of feedback, and furthermore to stress the fact that we can, indeed, improve our systems of feedback which have evolved through the millenia of human experience.

We must begin to identify our feedback systems in agriculture. The diagram I started to show you is incomplete: to each action arrow there should be added a feedback arrow: only then do we have a complete loop which is able to respond to changes in either realm. Instead of the linear relation: research - application, for instance, we must think in terms of a circular or spiral relationship: research - application - research and so forth. This is not a job for researchers alone to do. The identification and implementation of workable feedback loops is a job for all concerned with agriculture.

Towards the end of my allotted time, let me list the ingredients which I feel are necessary for a better feedback system for agriculture and agricultural research, as a challenge to the educators:

a) Researchers both competent in their specialty and responsive to the problems of industry.

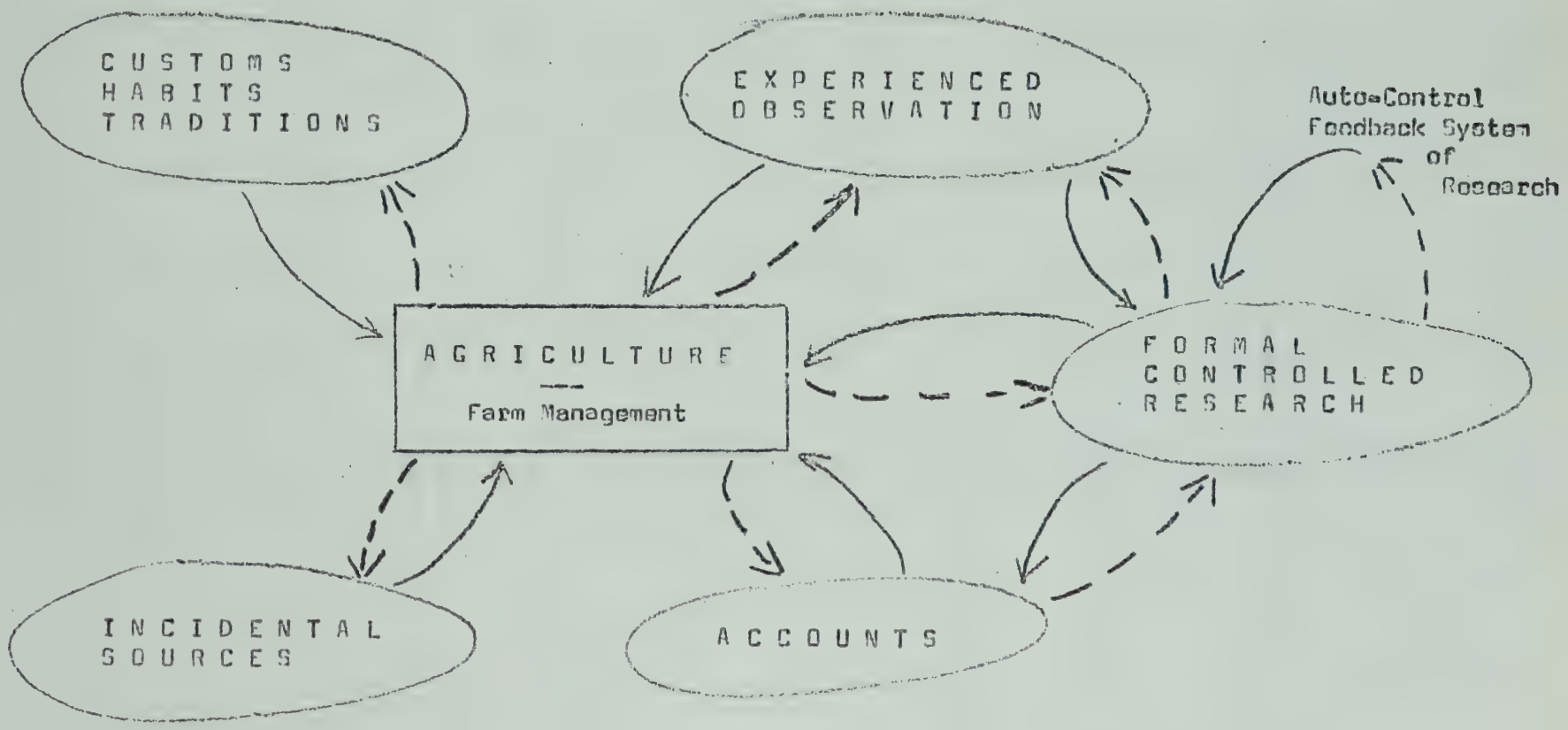
b) An informed public able to evaluate research findings.

c) Lines of communication.

d) Information specialists who can improve the flow of information in both directions.

INFORMATION FLOW TO AGRICULTURE AND FEEDBACK

WHICH MODIFIES THE INFORMATION SOURCES



Information flow to agriculture (primary flow)

Secondary information flows

While we think about improving the feedback system, we must not forget the contents. Our department is moving in several directions at once. But if you look closely, you will find that we stress the following areas which seem important to us:

a) Improving the agricultural information system.

b) Information on the general directions of the economy as they affect farm planning.

c) The changing framework of agricultural marketing and processing.

d) The changing nature of agriculture: how best to prepare young people for the life of farming - personality patterns, training, formal education, adult education.

Of course there is a continuing need for specific research to upgrade the technical efficiency of agriculture - in engineering, plant science, soil science, and animal science. But let me once again quote Lord Snow:

> "There was some excuse for our ancestors not foreseeing the effects of the first industrial revolution. There is no excuse this time ... We should be investing more - and more, perhaps, even than [the United States] - in the social sciences ... We are ignorant of the social life ... We are more ignorant than is wise, or safe, or human."[3]

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[3]Snow, C.P., Ibid.

EXHIBIT 6

INVOLVEMENT IN UNDERGRADUATE EDUCATION*

by Murray H. Hawkins**

Student disinterest and teacher apathy are threatening to turn academic activity at the undergraduate level into a frustrating and meaningless experience. The professional nature of Agricultural Economics has tended to blunt this development, but agriculturists cannot become complacent nor deny the possibility of its emminent arrival. The striving for excellence and the increasing prestige in graduate education and research (in conjunction with the role of the Agricultural Economist as a consultant) have hastened the downgrading of undergraduate teaching as a vocation, and larger academic classes tend to reinforce the situation.

Student Awareness

Students instinctively recognize the growing preoccupation and indifference of some of their professors and the consequent mediocracy of instruction at the undergraduate level. The bright student looks eagerly forward to graduate school where he will finally be allowed to do this thing. The average student "kills time" until that great day when he can enter the "real" world. The below average student drifts in a state of stultified helplessness, unstimulated and unloved. More and more frequently inquiring minds break out of this situation and vigorously protest their abandonment.

These statements are not a revelation; indeed these reflections even cross the desks of university administrators from time to time. Yearly statements are dutifully issued to the faculty that undergraduate teaching is the

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* This paper was prepared for presentation at the American Agricultural Economics Association meeting, University of Kentucky, Lexington, Kentucky, August 17-20, 1969.

** Associate Professor, Department of Agricultural Economics, University of Alberta, Edmonton, Alberta.

primary role of the academic community. After conventional lip service has been paid to the ideal, the statements are carefully and firmly set aside at the first possibility. Staff promotion, appointments, tenure considerations, and other aspects of academic life are then evaluated on the more traditional basis.

The Task

What can be done? The goal of the institution should be to totally involve the entire academic staff, auxillary staff, and the undergraduate students in the learning process.

The Assumption[1]

One must assume that staff, students, and administrators are willing and able to involve themselves and that they have the means for doing so.

The Technique of Involvement

There is no perfect solution. The techniques suggested here have been used with varying degrees of success by the author and his colleagues. Nor does this list of methods under discussion exhaust the possibilities.

The undergraduate course structure and curriculum needs reshaping with concern and ingenuity. Stereotype lectures, exams, and uninspired grading systems must give way to new approaches. Reforming and enriching the undergraduate program should assume first priority in the hierarchy of academic and quasi-academic endeavours. An attitude of total commitment should prevail in departments teaching undergraduates. Given an environment in which undergraduate instruction takes priority and in which undergraduate

[1] Perhaps this assumption is unwise, but most economists succeed in eliminating the real problems with a selection of assumptions.

teaching assignments are given to staff members able to communicate with their students, then it will be possible for the lecturer to begin the task of mutual involvement.

A Two Course Core[2]

The subject matter for a core subject area in Agricultural Economics should be divided into at least two component parts. Typically this division will involve two quarter or semester courses. Care must be taken in the initial course to adequately prepare the student for his adventure into in depth participation in the second.[3]

Component One

The first component course should be of a theoretical nature and should prepare the student to plunge into the second course. This arbitrary course division would also allow non-specialists to participate at the lower course level. The procedure is somewhat like preparation in traditional undergraduate education for graduate school and differs only in that its application may occur at the second, third, or fourth year of the university program, its implementation depending on the level of prerequisites and general background material.

The first course should concern itself with an intensive lecture and reading program. However, this approach is not as traditional as it would first appear. The first requirement of this course or, for that matter, any course should be to prepare a detailed and specific course outline. The

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[2] The core area within the author's area of experience include marketing and agri-business management.

[3] In addition to the first course listed herein, all necessary mathematics, statistics, etc., courses should have been taken.

outline should include such matters as course content, general course policy outlines, grading procedures, weekly reading assignments, selected supplementary readings, quiz and midterm dates, office hours ,[4] term papers, and miscellaneous course assignments. The outline should be distributed on the first day of class. It becomes, in effect, an unofficial contract between the class and the instructor. It provides a proposed plan of operation for the course that will prove invaluable in control and evaluation proceedings. In addition, the students will have a firm foundation from which to operate and (to a limited extent) from which to bargain. All course outlines should be filed with the Department Chairman and interested contemporaries.

The reading list for undergraduates should be realistic in length and depth. Detailed and prolonged reading assignments that are developed to illustrate how "high powered" a course is, succeed only in discouraging the class and dampening the enthusiasm norm of the students. The selection of a good text plus the addition of two or three well chosen supplemental readings should prove adequate. An additional bibliography may be interesting for some students and should also be provided. In an era in which undergraduate curricula are being comprehensively overhauled, it is essential to be realistic in regard to the total number of hours available to any one course. A well chosen, short, and intensive reading list upon which the student is examined in depth would do much to reduce the credibility gap between the instructor and the students.

In larger classes or at the lecturer's discretion, class representatives

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[4] An open door policy during the school term should be department policy. It is recognized that large classes and abuses of the policy may limit the universal application of this principle. However, consulting and extracurricular affairs should not impose office hours.

should be elected to provide feedback and consultation on the course presentation and to provide suggestions for the 25 to 30 percent of the course content that would be under student advisement. In an introductory three-lecture per-week course, two lectures should be directly the sole responsibility of the instructor. The final lecture should concern itself within the relevant subject area but should involve some additional material on subjects excluded in the course or a deeper analysis of course materials of general interest to the class. Special speakers, interested students, or the instructor himself could offer the third lecture.

Student protest has almost eliminated the "snap quiz" and irrelevant term paper. Realistically one should not regret their demise. However, the substitution of a number of short, concise, prearranged quizzes is an excellent technique for involving the student in the course material. The use of this evaluation technique allows the elimination of the lowest quiz grade from the final tally. It is extremely difficult to be prepared for all efforts, and students note the inherent justice of this procedure. Term papers, with the growth of excellent student libraries and their collection of source materials, are becoming a less useful device in the learning process. They are difficult to evaluate, and outright plagiarism is becoming increasingly prevalent. If term papers are to be used, there is a need for ingenuity and variety of design in order to "action orientate" the material. A comprehensive, objective student evaluation should complete the first course.

Component Two

The second course in the two-course undergraduate presentation should be a "mini" version of graduate school. It should evolve around a balanced

attack on the perception of the student and his total involvement in the subject matter.

In several areas of agricultural economics computer games could form the basis of the course. In addition, selected case studies, field trips, debates, oral and written team presentations, and visual aids could supplement this approach. The above approaches can be abused, but properly used, they can have a considerable impact in involvement. Several recent developments are also worth mentioning. Through the use of television and video tape, class projects take on a new dimension. For example, preparation of a half hour television presentation on an approved topic stimulates the undergraduate to give his time and interest to the project and involves him completely. Moreover, screening of the final product is a worthwhile experience for the entire class.

As a matter of policy Agricultural Economics Departments should develop research projects that utilize the considerable talents of their undergraduates. Supervision of their endeavours and indeed the development of the working program could be the responsibility of selected graduate students; the goal of the "mini" research experience being to involve the professor, graduate student, and undergraduate student in a coordinated effort.

Through the use of the grading system student participation can be broadened even further. At an early stage in their careers students should be contemporaries. Provided that preparation in the first phase of the two-course program has been adequate and that detailed grading guidelines are available, the lecturer should have few qualms in regard to sharing this onerous task.

It becomes necessary at this point to reinforce a previous point. Unless the student has been prepared adequately at an earlier stage in the educational process, the implementation of the involvement techniques will have many of the characteristics of a "mixed orgy".

General Observations and Conclusions

The challenge of maintaining a meaningful relationship between the student and his teacher has become an increasingly difficult task. Motivation becomes an intuitive feeling which can only be developed through joint involvement. Incentives to learn must be delicately integrated throughout the curriculum. Agricultural Economists have stressed that bountiful production depends on the wise use of incentives in order to direct and stimulate individual entrepreneurs. The lesson has been learned well in the general policy area but not at the undergraduate teaching level. Implementation of an impersonal grading curve has effectively dampened the grade incentive in the undergraduate program. Classes are quick to establish a "bogey" or norm, and instructors are forced to live with this informal climate.

This text has attempted to outline an argument to revitalize the undergraduate teaching and learning experience. The revitalization goal will become a reality only when the academic staff, the administration, and the students develop a deep feeling of commitment and mutual involvement.

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EXHIBIT 7 JAN 26 1970

Department of Agricultural Economics & Rural Sociology

UNDERGRADUATE SPECIALIZATION IN AGRICULTURAL ECONOMICS

The Department offers a program of specialization in Agricultural Economics which is sufficiently flexible that it can be adapted to meet most individual interests and needs. Students may follow a general program or one of the three areas of special emphasis. The general program is especially appropriate for students who wish to prepare themselves for graduate studies of Agricultural Economics.

The Farm and Ranch Management option stresses the economic principles and management techniques which are most useful to workers in farm business management. It is designed for students interested in farm and ranch operation, professional farm management, farm credit, and agricultural extension work. It is particularly appropriate for students who desire a joint major or minor specialization in other departments, such as Animal Science, Agricultural Engineering, Plant Science, and Soil Science.

The Marketing and Agribusiness option stresses the economics of marketing farm products and farm supplies as well as the management of agricultural business enterprises. It is designed for students interested in the operation and management of businesses serving agriculture. The option is particularly appropriate for students wishing a joint major or minor specialization in other departments such as Animal Science, Food Science, and Plant Science.

General Rural Sociology Program The emphasis of this program is upon training in the social sciences. Students will receive instruction in social theory, quantitative analysis, and related areas. This course of study will enable the student to prepare for the occupational opportunities available for rural sociologists and to also have the background necessary for graduate work in Rural Sociology.

Sociology of Development The emphasis of this program is on rural societies, the community, and regional development. Students receive training in theories of change, application of these theories to planned change, and methodology. This course of study prepares the student for work in research, extension work, and development.

The general requirements for specialization in Agricultural Economics and Rura Sociology are outlined on pages 2 and 3. These requirements are in addition to the general requirements of the Faculty of Agriculture. Recommended electives for the various options are listed on page 4. Additional information on courses, facilities, and career opportunities may be obtained from the Department Office (room 515, General Services Building).

Assistance in course selection and timetabling may be obtained from the Undergraduate Supervisor for the Department. Students who are interested in specializing in Agricultural Economics and Rural Sociology are urged to contact the Undergraduate Supervisor before the end of their first year of studies. Although it is possible to start a specialized program after the second year, it usually involved timetabling difficulties and problems with prerequisites.

COURSE REQUIREMENTS FOR SPECIALIZING IN AGRICULTURAL ECONOMICS

		Credits
First Year		
See Faculty of Agriculture Calendar for details of requirements		
Total		30
Second Year		
AgEc 367. *Economics of Agriculture*		3
Econ 301. *Intermediate Economic Theory*		6
Mathematics and Statistics[1]		3
RSoc 300. *Introduction to Rural Sociology*		3
Approved Electives*		15
Total		30
Third and Fourth Years		
AgEc 416. *Statistical Analysis*		3
Three of:		9
AgEc 369. *Elements of Farm Management*	3	
AgEc 384. *Agricultural Marketing*	3	
AgEc 453. *Land Economics*	3	
AgEc 473. *Agricultural Policy*	3	
RSoc 356. *Sociology of Rural Life*	3	
Agricultural Economics Electives**		6
Agricultural Electives***		18
One of:		3
Comput 440. *Linear Programming and Matrix Algebra*	3	
Math 243. *Linear Algebra*	3	
Econ 401. *Economic Analysis*[2]		6
Approved Electives		15
Total		60

* Chem 230 is required in the second year if it was not taken in the first year. Electives taken in Agricultural Economics and other departments in the Faculty of Agriculture may be counted toward the requirements for such courses.

** Students who wish to prepare for graduate studies in agricultural economics should take two of AgEc 433 *Agricultural Production Economics*, AgEc 453 *Land Economics*, and AgEc 463 *Agricultural Marketing Economics*.

*** Each student is required to take courses in at least three departments in the Faculty of Agriculture other than the department in which he is specializing, and he must take at least six half courses or their equivalent in those three departments.

1 (a) Assuming a student has credit for Math 201 in his 1st year he will be required to take 3 hours of statistics in his 2nd year. (b) If a student has credit for Math 240 and 241, he will be required to take 3 hours of calculus or 3 hours of statistics in his 2nd year.

2 Students in Agricultural Economics are required to take Economics 301 and 6 hours of 300 or 400 level Economics with a preference for Economics 401.

COURSE REQUIREMENTS FOR SPECIALIZING IN RURAL SOCIOLOGY

		Credits
First Year		
See Faculty of Agriculture Calendar for details of requirements		
Total		30
Second Year		
AgEc 367. *Economics of Agriculture*		3
Econ 301. *Intermediate Economic Theory*		6
Mathematics and Statistics[1]		3
RSoc 300. *Introduction to Rural Sociology*		3
RSoc 356. *Sociology of Rural Life*		3
Approved Electives*		12
Total		30
Third and Fourth Years		
AgEc 416. *Statistical Analysis*		3
AgEc 473. *Agricultural Policy*		3
Agricultural Electives**		18
Three of (half course basis):		9
RSoc 456. *Rural Social Problems and Public Policy*	3	
RSoc 457. *Theory and Practice of Rural Extension*	3	
RSoc 458. *Agrarian Social Movements*	3	
RSoc 459. *Sociology of Community Development*	6	
Math 243. *Linear Algebra or Comput 440 Linear Programming*		3
Soc 341. *Social Psychology*		3
Soc 361. *Social Organization*		3
Soc 411. *Methods of Sociology Analysis*		3
One of:		
Soc 440. *Advanced Social Psychology*	3	
Soc 460. *Social Organization-Organization Theory*	3	
Approved Electives***		12
Total		60

* Chem 230 is required in the second year if it was not taken in the first year. Electives taken in Agricultural Economics and other departmentsin Faculty of Agriculture may be counted toward the Faculty requirements for such courses.

** Each student is required to take courses in at least three departments in the Faculty of Agriculture other than the department in which he is specializing, and he must take at least six half courses or their equivalent in those three departments.

*** Students are strongly urged to take Agricultural Economics 453 and Sociology 432. The remainder should be taken in areas of Anthropology, Sociology, Agricultural Economics or Geography.

1 (a) Assuming a student has credit for Math 201 in his 1st year he will be required to take 3 hours of statistics in his 2nd year. (b) If a student has credit for Math 240 and 241, he will be required to take 3 hours of calculus or 3 hours of statistics in his 2nd year.

RECOMMENDED ELECTIVES FOR SPECIAL AREAS OF EMPHASIS

		Credits
1. Farm and Ranch Management:		
Acctg 202.	*Introductory Accounting*	3
AgEc 369.	*Elements of Farm Management*	3
AgEc 384.	*Agricultural Marketing*	3
AgEc 433.	*Agricultural Production Economics*	3
AgEc 443.	*Agricultural Finance*	3
AgEc 453.	*Land Economics*	3
AgEc 473.	*Agricultural Policy*	3
RSoc 356.	*Sociology of Rural Life*	3
2. Marketing and Agribusiness:		
Acctg 202.	*Introductory Accounting*	3
AgEc 369.	*Elements of Farm Management*	3
AgEc 384.	*Agricultural Marketing*	3
AgEc 385.	*Agricultural Prices*	3
AgEc 422.	*Managerial Economics for Agricultural Businesses*	3
AgEc 423.	*Management Techniques in Agriculture*	3
AgEc 463.	*Agricultural Marketing Economics*	3
AgEc 473.	*Agricultural Policy*	3
RSoc 356.	*Sociology of Rural Life*	3
3. General Agricultural Economics (Recommended for students who wish to prepare for graduate studies in Agricultural Economics):		
AgEc 368.	*Economics of World Agriculture*	
AgEc 369.	*Elements of Farm Management*	
AgEc 384.	*Agricultural Marketing*	
AgEc 473.	*Agricultural Policy*	12
Four of:		
AgEc 422.	*Managerial Economics for Agricultural Business*	
AgEc 423.	*Management Techniques in Agriculture*	
AgEc 433.	*Agricultural Production Economics*	
AgEc 443.	*Agricultural Finance*	
AgEc 453.	*Land Economics*	
AgEc 463.	*Agricultural Marketing Economics*	
AgEc 493.	*Agricultural Growth and Adjustment*	12
RSoc 356.	*Sociology of Rural Life*	3
Acctg 202.	*Introductory Accounting*	3

4. General Rural Sociology

Students are strongly encouraged to take as many courses as possible in the areas of theory, methods, and statistics. Other courses in the social sciences (ie. geography, anthropology, economics) should also be considered.

5. Sociology of Development

Students in this program shall work out their specific needs with the undergraduate advisor as each program may be towards a specific specialization (ie. community development, extension etc.). Students are encouraged to obtain as broad a background in other areas as possible.

EXHIBIT 8

Undergraduate Courses in Agricultural Economics

1970-71

INT D 367. *Economics of Agriculture.* *3 (First Term, 3-0). The nature and scope of agricultural economics; economic aspects of agricultural production, marketing, finance, resource use, prices, and policy; relation of the agricultural sector to the economy as a whole; analysis of structural change, economic growth and adjustment in agriculture. Prerequisite: Economics 200. Note: Formerly AgEc/Econ 367.

INT D 368. *Economics of World Agriculture.* *3 (Second Term, 3-0). A survey of world structure of agricultural production, consumption, and trade; international agricultural policies and agreements; impact of regional economic integration on agriculture; interrelation of economic development and trade in agricultural commodities. Prerequisite: Economics 200. Note: Formerly AgEc/Econ 368.

AG EC 369. *Elements of Farm Management.* *3 (Either Term, 3-3). Application of economic principles to organization and management of a farm; budgeting, size of business, choice of enterprise, timing of production, farm labor utilization, farm accounting, leases and farm credit. Prerequisite: Economics 200: INT D 367 recommended.

AG EC 381. *Retail Marketing of Agricultural Products.* *3 (First Term, 3-0). Wholesale and retail food market structures and conduct, with emphasis on consumer motivation, retail pricing strategies, and operational techniques and problems. Prerequisite: Economics 200 or consent of the Department.

AG EC 384. *Agricultural Marketing.* *3 (Either Term, 3-0). Organization, institutions, and functions of agricultural markets; marketing processes for specific commodities. Occasional field trips may be arranged. Prerequisite: Economics 200 and third or fourth year standing; Interdepartmental 367 recommended.

AG EC 385. *Agricultural Prices.* *3 (First Term, 3-0). Price determination, market price discovery, future prices, and price behavior over time; exercises in statistical price analysis. Prerequisite: Agricultural Economics 384 or Interdepartmental 367.

AG EC 400. *Special Topics.* Maximum *3. Study of a selected topic or problem requiring both written and oral reports. Prerequisite: Consent of the Department.

AG EC 416. *Statistical Analysis.* *3 (Second Term, 3-3). Sources of economic data relating to agricultural production, processing and marketing; collection of data, sampling methods; analysis of data, tests of hypotheses, analysis of variance, regression, and correlation; time series analysis; presentation of data. Prerequisite: Statistics 255, 341 or 366; corequisite: Comput. Sc. 440 or Math 243 or consent of the Department.

AG EC 422. *Managerial Economics for Agricultural Business.* *3 (First Term, 3-0). Management in farm supply, service, and distribution businesses; economics of managerial decisions. Prerequisite: Interdepartmental 367. Accounting 202 recommended.

AG EC 423. *Management Techniques in Agriculture.* *3 (Second Term, 3-0). Application of decison-making techniques to the management of agricultural business. Prerequisite: Agricultural Economics 422.

AG EC 433. *Agricultural Production Economics.* *3 (First Term, 3-0). Production theory and principles applied to use of land, labor, and capital; static and dynamic firm theory; farm size; resource and product combinations; production location; timing of production; cost structure; uncertainty and expectations. Prerequisite: Agricultural Economics 369.

AG EC 443. *Agricultural Finance.* *3 (Second Term, 3-0). Capital requirements in agriculture; principles of financial management; the farm credit market; credit institutions. Prerequisite: Agricultural Economics 369 or Interdepartmental 367.

AG EC 453. *Land Economics.* *3 (Second Term, 3-0). Principles of land use, population pressures, resource conservation, theory of rent, farm tenure and appraisal. Prerequisite: Agricultural Economics 369 or Interdepartmental 367.

AG EC 463. *Agricultural Marketing Economics.* *3 (Second Term, 3-0). Economic aspects of agricultural markets; location of market activity; market structure and performance. Prerequisites: Agricultural Economics 384, Economics 300 or 301.

AG EC 473. *Agricultural Policy.* *3 (First Term, 3-0). Economic policy aspects of the production, marketing, and income problems of farmers. Prerequisite: Interdepartmental 367, Economics 300 or 301.

AG EC 493. *Agricultural Growth and Adjustment.* *3 (Second Term, 3-0). Achieving optimum use of resources in agriculture under conditions of economic growth and technological change. Prerequisite: Interdepartment 367, Economics 300 or 301.

R SOC 300. *Introduction to Rural Sociology.* *3 (First Term, 3-0). The interrelations of personality, society, and culture; social processes, structures, institutions, and functions as they affect rural society. Note: Not open to students who have credit in Sociology 202.

INT D 356. *Sociology of Rural Life.* *3 (Second Term, 3-0). The rural community and rural social systems, with special reference to changes in the rural way of life. Prerequisite: Rural Sociology 300 or Sociology 202 or 403 or consent of the Department of Agricultural Economics or Sociology. Note: Formerly Soc/Rural Soc 356.

INT D 456. *Rural Social Problems and Public Policy.* *3 (First Term, 3-0). Social problems in Canadian rural life; analysis of policy making processes related to these problems. Prerequisite: Interdepartmental 356 and 367 or consent of the Department of Agricultural Economics or Sociology. Note: Formerly Soc/Rural Soc 456.

R SOC 457. *Theory and Practice in Rural Extension.* *3 (First Term, 3-0). How farm people accept new ideas. Processes in planning and developing effective extension programs for rural people.

INT D 458. *Agrarian Social Movements.* *3 (Second Term, 3-0). A sociological analysis of major agrarian social movements in North America. Prerequisite: Interdepartment 356 or consent of the Department of Agricultural Economics or Sociology. Note: Formerly Soc/Rural Soc 458.

INT D 459. *Sociology of Community Development.* *6 (3-0). Human communities; their institutional structure, ecological factors associated with patterns of growth, community relations, community planning and community development. Prerequisite: Interdepartmental 356 or Sociology 202 or 403 or consent of the Department. Note: Formerly Soc/Rural Soc 459.

EXHIBIT 9

PROVISIONAL FUNCTIONAL REGIONS FOR REGIONAL AND RESOURCE PLANNING IN THE SOUTH SASKATCHEWAN RIVER BASIN (ALBERTA SECTION)

Wolfgang H. Schulze
University of Alberta
Edmonton, Alberta

February 1968

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THE NOTION OF A FUNCTIONAL REGION

FOX (1966) has shown that, at least in Iowa, a definite tendency exists for population to concentrate in such a way that no farm or rural residence will be more than 50 miles from its central city. This development is taking place without prodding by governments or any other agency.

This modern settlement pattern is the inevitable consequence of (a) the automobile, (b) a good road system and (c) the homogeneity of settlement. He cites evidence to show that in Iowa the population of the place near the center of these "functional economic areas" is increasing, while it stagnates or declines in the peripheral areas.

As early as 1915 GALPIN had shown that the grid of rural towns in Wisconsin allowed most farmers to reach their community center within about one hour. Only, in the age of horse and buggy, the one-hour distance was five miles.

The automobile has expanded this one-hour limit to fifty miles, an increase by a factor of ten. Rural residents are getting into the habit of doing their shopping in the nearest major city, rather than the old community town or village. The general store, the local garage, the local restaurant and tavern find themselves with less and less business. And as business declines, it becomes even less attractive to do business there, aggravating the process of re-orientation of shopping pattern.

Local businessmen find it more and more difficult to continue operations. They can't compete with the city merchant for variety of stock,

We have recently observed a mass exodus of farm machinery dealers, out of the small communities towards the larger ones. There is every reason to believe that such a concentration process is going on in rural Alberta. Many rural communities already suffer from the loss of purchasing power due to the decline of the farm population. But the problem is really aggravated by the increase in travel speed (and the carrying capacity) due to the technological advance from horse teams to cars, pickups and trucks.

The typical 1915 community trading area included 200-300 farm families on 50-75 square miles assuming that the modal farm size was the quarter section. The tenfold rise of the convenient travel distance has increased the typical trading area by a factor of (10 x 10 =) 100. Now the typical trading area, within a one-hour travel radius, measures 5000-8000 square miles. And even if we assume that the modal farm size is now one section or more, we find that 5000-8000 farm families live within shopping and commuting distance of one central place. A place this size, which should support a population of 15,000 to 30,000 from services incidental to agriculture alone, is no longer a village community, where everybody knows everybody. It is a place large enough to provide a labour pool and convenient market for attracting additional industry. It is a place which has many of the characteristics we commonly associate with urban living - variety of activities, social bonds along interest and occupational lines rather than neighbourhood lines (communality instead of community), "alienation" between the person and the job, "depersonalized" competition, freedom to move and to change jobs, ease of communication,

mobilization of thought, action and resources etc.,(cf. Mumford, 1961, Pl. 48)

The central place in the automobile age is truly a city by almost any definition. A number of people have suggested recently that the answer to the decidedly unhealthy super cities of this century is a grid of cities from 100,000-250,000 in size, spread in a regular grid pattern across the continent (FISCHER, 1966; SPILHAUS, 1967), spaced about 100 miles apart. Now this pattern coincides nicely with the central place pattern that results from the newly found mobility of rural residents. The centralization move triggered by the automobile will result in just the pattern of urban settlements which these perceptive social commentators feel would be desirable from the theoretical point of view. It will not be necessary to plan such new cities, and build them on the open pasture. They exist right here and now and are growing. It recognizes the natural area relations and dependencies of people living in a contiguous area.

The dominance of central cities does not mean that all country towns (HOFFER, 1964) are doomed to be abandoned eventually. Some secondary or satellite towns will continue to serve the resid , and remain viable for a number of reasons. If the population density is sufficient there will be room for fully competitive local food stores and other commercial service outlets, and for social and political services and institutions - the school, the church, the local government, the local inn. At the periphery of the' trade area the smaller places will have a better chance to resist the lure of the central city. A Smaller community will also persist, or be created anew, around resource-based industrial and other establishments that do not depend on local services alone for their economic base.

Functional regions certainly are not homogeneous regions: their

economic and social pattern, their physiographic and natural recource pattern may be highly diversified. The purpose of delimiting functional regions is different from the purposes which led to the definition of statistical regions or Census Divisions in some Canadian provinces. Census Division boundaries are drawn to combine areas of similar social and natural characteristics.

The outstanding fact of a functional region is the interdependency of the residents within a region, which geography and technology impose on them. Residents of a region look at the central place(s) as their natural centers of communication and trading, of social and political interaction. The concept of a region is not a legal or statutory concept so much as an empirical one. It defines the actual community (GALPIN), not the official one. It will change as transportation modes, social and economic interaction, and social awareness of its residents change.

For area economic analysis, functional regions provide practical advantages. In FOX' (1966, p. 124) words functional regions

> "are relatively self-contained for regional accounting and 'data system' purposes in that the residents ... do nearly all of their working and shopping within the boundaries of the same [region]. The residentiary activities of adjacent [functional regions] can be separated or partitioned more accurately than those of any areas of equal geographical extent of which I can conceive."

While the concept of a functional region may give empirical studies and administrative considerations a focus, it must not blind us to the individual features of any given location. In any region there will be unique local characteristics demanding more individualized treatment. Nor should the functional region concept prevent us from exploring the important

inter-regional relations which vitally affect economic fortunes within the region. We will see now what the actual pattern of places looks like in Southern Alberta.

Central Places and Functional Regions in Southern Alberta

Within the drainage area of the South Saskatchewan three cities are located, each two to 2 1/2 hours travelling time apart by car: Calgary, Lethbridge and Medicine Hat. Fifty-mile circles drawn around these places cover much of the area.[1] The 50-mile circles around Lethbridge and Medicine Hat touch at Grassy Lake, but there is no further overlap. In fact it appears that a considerable part of the region is too far away from the three cities to be included in their trading area. The extreme Southwest, from Pincher Creek on west, the area between Claresholm and Nanton, Vulcan county, Newell county (Brooks and Bassano) parts of Wheatland county and the extreme Southeast (east and south of Milk River, including the open places of Etzikom, Manyberries and Wildhorse) are 50-80 miles and up to two hours of one-way travel away from their nearest city. Nor, for the most part, are they within close range of any major place in B.C., Saskatchewan or Montana.[2] It remains to be shown whether these regions continue to support smaller, more conveniently located center, or whether residents of these more peripheral regions are attracted to the cities in spite of the greater distance.

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1 A somewhat more exact delimitation could be achieved if we measure the travel distance and time along the existing road system. This would result in a somewhat irregular polygon, without changing the main conclusions in any way. Such a polygon was actually drawn, but will not be presented here.

2 Only the extreme Southeast around Wildhorse is within the 50-mile radius of Havre (see map).

For analytical and planning purposes it is desirable to work within a geographical framework that conforms with the community pattern of the target period, that is, the functional area. Given this goal, the existing political boundaries are to be respected, of course. Some deviations from the ideal polygonal area pattern must be tolerated (map 2). The Provincial Planning Board, incidentally, has adopted virtually the same boundaries as the statutory boundaries of the Regional Planning Areas that are suggested by a functional area analysis.

Table 1 gives an indication of the size of the three regions involved. It is a happy coincident that the functional regions which suggest themselves through a locational analysis are nearly identical with the boundaries of the South Saskatchewan River Basin in Alberta. In fact smaller geographical entities (census divisions or municipalities) are no respectors of drainage areas at all. Any attempt to integrate existing political with physiographic boundaries at a lower level than the level of the functional region is bound to lead to innumberable practical difficulties, data reconciliation etc.

A reliable but expensive way of determining the current economic base of a community is the trade area survey, which attempts to record the actual trading pattern of people. Yet a general idea can be obtained more cheaply by studying retail sales volume, population change, and manufacturing activity. The 1966 Census of Canada has just become available. We will take a look at the population change from 1961 to 1966 as a measure of community viability.

Population Change and Distance From City

The 1966 Census is just being published and allows preliminary estimates of the extent of population changes since 1966. During this period Calgary, Lethbridge and Medicine Hat increased their population. (Table 2) Among the incorporated towns and villages, 20 showed an increase in population, while 47 registered decreases. (Table 3) In each community, a number of general and specific factors might have accounted for the actual change. We shall examine the statistical information for evidence of a concentration movement.

Since it was suspected that distance from the city could be a factor influencing population change, all incorporated places were grouped according to distance from the city. Then each group was divided into growing and declining ones (see Table 4). After further inspection, it was found desirable to separate the mining and resort towns from the primarily agricultural ones, all but one of which lost population during the period under study. For each group average population as of 1966, average change, and in some instances, statistical dispersion measures were computed.

1. Within 25 Miles. Seven of the ten places in the closest zone lost population. The three growing places (Airdrie, Nobleford and Picture Butte) all have a local industrial base.

2. Twenty-five to 50 Miles, The places in this intermediate zone averaged slightly smaller in size than in the near zone. Yet on the average they gained population. The average masks the fact that only 9 of the 25 places located here actually did gain population. The nine growing towns in this zone averaged 1933 population in 1966, and gained 14 per cent in five years. The declining places averaged only 563 in 1966, and lost more than 10 per cent of their population in five years.

3. Over 50 Miles. The average population gain among the "Agricultural" communities in the far zones was even higher than in the preceeding zone. Yet the average size of the places located was less than in the closer zone. Ten places gained population (average 15 percent). These growing places averaged 1081 residents, while the declining places averaged only 408 (according to the statistical test this is not likely to be a freak difference).

4. Mining and Resort Towns. The eight places combined in the fourth group are, on the average, 80 miles away from the nearest town. All but one place lost population. This is contrary to the concentration movement observed among the places in the second and third zone. The decline must be related to other factors, like the adjustment process in coal mining, and the settlement policy of the National Parks Service.

If we abstract from this special group, we note that the average community size declines with distance from a city. In the more distant zones, the larger places gain population, while the smaller ones seem to be in a process of losing population. It is apparent that a concentration process takes place which allows only the larger towns to survive. The concentration process has advanced further in proximity to the cities themselves. In other words, the further away from a city, the better the chances of a community to retain its trade and survive as an entity.

By contrast, in the near zone, the concentration process leads to a depopulation of even larger communities. It appears as if only the places with a substantial own industrial base or other special advantages will have a chance to withstand the lure of the city only 30 car minutes away.

The evidence provided by the latest Census thus substantiates the hypothesis that a concentration process is taking place in the settled places of Southern Alberta. As yet only the towns within about twenty-five miles from the three cities are seriously threatened with massive population decline. Beyond that limit concentration favours the existing larger (1500 population and up) communities, and threatens the existence of the smaller ones. In the most remote zone the concentration process has not advanced as much as in the intermediate zone. There is no evidence that that concentration process has come to an end; neither is there any evidence to the contrary. If, however, we feel justified in drawing the parallel to the development, in the admittedly more densely populated, Iowa, we cannot help but worry about the future of several more of the blooming middle-size towns within the 50-mile zone around Calgary, Lethbridge and Medicine Hat.

Retail Sales and Population Movement

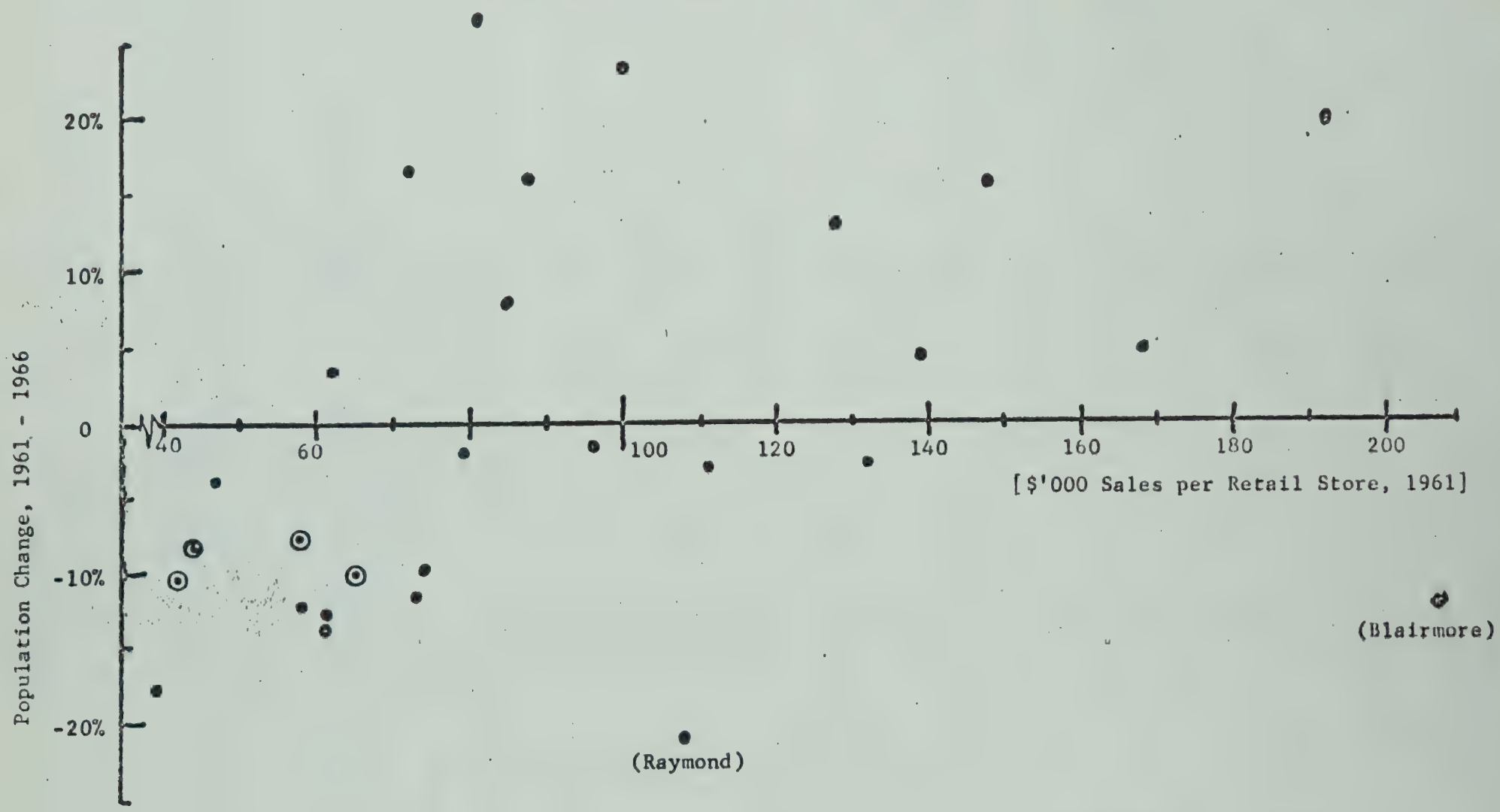
It is possible to relate the change in urban population in Southern Alberta to measures of retailing also obtained in the 1961 Census. Table 5 shows the number of stores, sales volume, sales per store, number of stores per 100 residents and retail sales per resident, for selected communities in Southern Alberta. Of particular interest to us are the last three columns of Table 5. Average Sales per Store should be a measure of the relative competitiveness of the average retail store in a given location. The greater the average sales volume perstore, the more likely the stores are profitable concerns, the smaller, the more likely there will be some stores who just won't make it in the future. The average sales

volume differs from over $200,000 in Blairmore to $39,000 in Black Diamond. Communities with small stores are likely to lose some of their stores, and hence some of their economic base for the gainful employment of its residents.

Figure 1 shows the relation between average retail volume in 1961 and population change in the five years since 1961. In general the graph confirms the suspicion that low store volumes are associated with population declines. However, the relation is much too loose to be used for predictive purposes. A number of communities gained population with retail store volumes of no more than $60,000, while Blairmore, in spite of the highest retail sales volume per store lost considerable population. Obviously there are other factors to consider if the future of a community is to be predicted.

Table 5 proves revealing also in another respect; assuming that residents within a region have about the same amount of money to spend, regardless of residence, we can use the measure of " Sales per Capita" of population to determine the trading concentration and the relative attractiveness of a community for people. Above average per capita sales indicate a locally important shopping center; below average sales are a sign that residents carry their money elsewhere to do their shopping. Thus sales per capita may be used as a measure of the relative competitiveness of a given community in attracting retail business.

Places like Coaldale, Redcliff and Forest Lawn display a typical suburban or "bedroom town" sales pattern with much below average per capita sales. It is not difficult to imagine that the alternative of shopping in the nearby city is just too tempting for the resident of the suburb. Only food stores, drug stores and similar establishments have a chance to survive.



POPULATION CHANGE AND RETAIL STORE SIZE, SOUTHERN ALBERTA COMMUNITIES, 1961 - 1966.
(Source of Data: D.B.S. Census of Canada 1961, 1966)

The farmer who comes to town will bypass these places, too, since they lack a full line of retail outlets, competitive prices, and a good variety of goods in individual stores.

The cities themselves, of course, write their own ticket. Their per capita retail sales volume ranks very high. But the cities are surpassed by such places as Brooks, Cardston, Vulcan, Blairmore (!) High River, Olds and Didsbury, which apparently attract a considerable amount of retail trade from their environment.

Below the regional average fall places like Raymond, Magrath, Coleman, Bellevue, Okotoks and Black Diamond. Since many of these places also have a relative large number of stores relative to their sales volume, we must assume that these places are losing ground to competing towns and central cities.

By comparing the sales outside the places listed with the averages for the region, we get some impression of the extent to which retailing is already concentrated in these communities rather than in small local stores in villages and unincorporated places.

Inspection of the retail sales data thus confirms essentially the impression that a concentration movement takes place in the rural towns of Southern Alberta. Future studies must be directed to fill the gaps left by the D.B.S. Census. Fortunately, the Alberta Bureau of Statistics does collect information on retail, wholesale and service trades volume on a continuing basis.

The Location of Manufacturing Activity

The location of manufacturing activity has an important effect on the viability of a community. Manufacturing for sale outside a community

provides an important source of purchasing power for the community, and requires the presence of additional manufacturing supply ("tertiary") industries and trade and commercial services. SOMBART distinguished between the "city founders" and the "city fillers" among the industries or, as we would say today, between export base and secondary activities (TIEBOUT, 1962).

For numerous reasons (proximity of market, ready supply of labour, availability of services, supplies, shipping facilities) industry tends to locate in cities, or close to cities, where other industries already exist, where the population lives highly concentrated. This tendency encourages the growth of central cities at the expense of country towns and open places. Exceptions are to be found only among industries highly dependent on localized raw materials which do not justify large shipping distances because of bulk (sugarbeets, pulpwood, coal, low grade ores, clay etc.) or perishability (vegetables for canning). Some industries locate away from existing clusters because of tax and other fiscal advantages.

Southern Alberta produces about 42% of Alberta's manufactured goods (see Table 6). However, of this the Calgary Metropolitan Area alone produces 31 percent, or 72 percent of the region's total. The city of Medicine Hat contributes 8 percent, and Lethbridge 10%. Only 11 percent are produced outside the three cities.

Manufacturing is indeed highly concentrated. This locational pattern reinforces the concentration tendency related to improved

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(Mining, petroleum and gas collection and processing also are primarily resource-based. These industries are not part of the manufacturing sector, however, and are to be treated separately.)

transportation facilities.

In the Lethbridge Region manufacturing is relatively more decentralized than in the Medicine Hat and Calgary Regions. In the latter, only 2 percent of manufacturing originates outside of the Metropolitan Area itself. In the Lethbridge Region around 40 percent originates outside the city. While these estimates are based on 1961 data (because the fine geographical breakdown of the data is not yet available), the pattern has not changed substantially since.

Resumé

Drawing on recent population changes, retail sales and manufacturing volume, we have found substantial evidence of a movement of residents of small communities to concentrate in a few larger ones. Close to the established cities of Medicine Hat, Lethbridge, and Calgary this tendency is noticeable in relatively large towns. Towns beyond the immediate range (25 miles) of the cities are increasing, while smaller places everywhere are losing population, except where special circumstances prevail. Improved modes of transportation, improvements of the highway system, and the tendency of manufacturing industry to locate in established clusters favour the emergence of the established cities as the major economic and social centers in Southern Alberta.

Beyond the cities a number of established country towns will always be needed, especially in the more remote parts of the region. These towns stand to gain the most by any economic activities which retains people in the area; they must fear most any development that favours extensification of land use and a lowering of the population density in the region. Smaller places will remain only where they can rely on resource-based or other

localized industrial activity.

While Calgary is a clearly established focus of industry and commerce, it is not likely that it will encroach upon the economic growth of the other two cities directly. It is more likely that the increasing labour and social costs of locating in Calgary will result in some spillover into the other regions. Such a development should be welcomed and encouraged. It will increase the competitiveness of the smaller cities, and broaden, in the long run, the economic base of the economy of the Province.

For obvious practical reasons (availability of data) it is suggested that further analysis of the economy of Southern Alberta (specifically the South Saskatchewan River Basin or Water Resources Region) be done in three separate functional regions, identified with the cities of Medicine Hat, Lethbridge, and Calgary. The boundaries of these regions should follow the statutory boundaries of the "Regional Planning Areas" of Medicine Hat, Oldman River (Lethbridge) and Calgary.

Two or more functional sub-regions may have to be separated from the three major regions. These sub-regions are Brooks (part of the Lethbridge Region), Vulcan and perhaps Pincher Creek - Blairmore (part of the Lethbridge Region).

Except that the Drumheller region (M.D. 47 and 48, I.D. 42 and City of Drumheller) should be excluded from the Calgary area, because it is located exclusively in the Red Deer River Basin. Mountain View county (Olds), which is this proposal is included in the Calgary Region, because it is also included in the Calgary Census Division. However, the Provincial Planning Board includes Mountain View County in the Red Deer Regional Planning Area. Since this county, too, is located within the Red Deer drainage basin, it may be desirable to treat it in connection with a study of the Red Deer Region.

The delimitation of functional regions is seen as a means to simplify further economic analysis and planning of the region. It should not detract from the need to study various features, especially water supply, distribution, and use patterns in the detail most appropriate for itself.

APPENDIX

Manufacturing in Southern Alberta, by Industry and Location, 1961 and 1964

The Dominion Bureau of Statistics publishes selected data of its Annual Census of Manufacturers on as small a breakdown by statistical division, and industry, as is compatible with the protection of the anonymity of the individual establishment. The last complete report has been issued for 1961, but selected data (to the Census Division Level) have been made available for 1964. Some of the published data and ratios derived from them are summarized in tables 7 to 9. It is assumed that the available statistics are of interest to determine (a) the size of entire industry in a given location or industry, (b) the average size of the individual establishment, (c) the performance in terms of value added per worker, etc., and (d) the earnings derived by employees, owners, and shareholders of a particular industry and a particular location. Even given the limitations imposed by the Statistics Act, this information will be useful in estimating the relative competitiveness of local industries in order to assess the future potential of an area.

Only for the City and Metropolitan Area of Calgary was it possible to provide substantial information on a number of manufacturing industries. This information is included because it will provide a basis for relating water requirement to economic growth projections.

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Table 1

AREA, POPULATION, AND NUMBER OF FARMS IN THREE CITY-CENTERED REGIONS IN SOUTHERN ALBERTA, 1961 AND 1966

Region	Area [square miles]	Total Population 1961	Total Population 1966	Farm Population 1961	Number of Farm Operators 1961
Medicine Hat Region[a]	8,090	39,140	38,858	7,380	2,165
Brooks Sub-Region[b]	2,327	10,365	10,773	5,127	1,104
Subtotal	10,417	49,505	49,631	12,507	3,269
Lethbridge Region[c]	10,394	111,550	108,238	29,811	6,313
Vulcan Sub-Region[d]	2,095	7,650	7,321	4,163	1,172
Subtotal	12,489	119,200	115,559	33,974	7,485
Calgary Region[e]	12,324	335,687	386,200	24,877	6,007
Grand Total	35,231	504,390	551,390	71,358	16,761
Percentage of Province Totals	13.8%	37.9%	37.7%	24.8%	22.9%

Sources: D.B.S., Census of Canada 1961, 1966
Alberta Dept. of Municipal Affairs, Annual Reports.

[a] Census Division 1

[b] Newell County only

[c] Lethbridge County, Warner County, Taber M.D.; Census Division 3; I.D. 8 (Waterton Park), I.D. 10 (Blairmore), I.D. 27.

[d] Vulcan County only

[e] Census Division 6; Wheatland County; I.D.'s 33 46 (Canmore), 50, 51 (Banff National Park).

TABLE 2

POPULATION CHANGE AND POPULATION DENSITY, THREE CITY-CENTERED REGIONS IN SOUTHERN ALBERTA, BY TYPE OF RESIDENCE, 1961 - 1966

Region and Residence	Number of Communities	Population 1966	Population Change 1961 - 1966 [percent]	Population Density [persons per sq. mi.]
Medicine Hat Region				
Medicine Hat, City	1	25,574	4.5%	
Towns	3	3,510	-2.0	
Villages	2	761	-3.7	
Farms and un-incorporated places	-	9,013	-12.4	
total	6	38,858	-0.7%	4.8
Brooks Sub-Region				
Towns	2	4,182	14.8%	
Villages	3	694	1.3	
Farms & un-inc. comm.	-	5,897	-8.6	
total		10,773	3.9%	4.6
Medicine Hat - Brooks		49,631	0.2%	4.8
Lethbridge Region				
Lethbridge, City	1	37,186	4.9%	
Towns	17	29,933	-0.2	
Villages	11	2,946	-9.9	
Farms & un-inc. comm.	-	38,173	-10.9	
total		108,238	-3.0%	10.4
Vulcan Sub-Region				
Towns	1	1,505	14.9%	
Villages	5	1,146	-13.4	
Farms & un-inc. comm.	-	4,670	-6.9	
total		7,321	-4.3%	3.5
Lethbridge - Vulcan		115,559	-3.1%	9.3
Calgary Region				
Calgary, City	1	330,575	19.7%	
Towns	8	10,870	6.0	
Villages	16	7,513	9.9	
Farms & un-inc. comm.	-	37,242	-11.5	
total		386,200	15.4%	31.3
Grand Total		551,390	9.3%	15.6

Source: See Table 1

TABLE 3

POPULATION MOVEMENT AND DISTANCE TO CITY, SELECTED INCORPORATED TOWNS AND VILLAGES IN SOUTHERN ALBERTA, 1961-1966

Name of Place	Road distance to nearest city	Population 1966	Population Change 1961-1966	
			number	percent
Medicine Hat Region				
Irvine	21	209	-31	-14.8%
Redcliff	5	2141	-80	-3.7
Bow Island	38	1160	+38	+3.3
Foremost	63	554	-7	-1.3
Burdett	45	207	-22	-10.6
Brooks Sub-Region				
Brooks	70	3354	+527	+15.7%
Bassano	95	827	+12	+ 1.4
Tilley	65	250	-7	-2.8
Duchess	78	223	+ 5	2.5
Rosemary	78	221	11	4.5
Lethbridge Region				
Coaldale	10	2541	-51	-2.0%
Picture Butte	16	1013	35	3.4
Nobleford	20	345	36	10.4
Barons	29	270	-75	-27.8
Taber	32	4534	+633	+16.0
Vauxhall	53	934	- 8	- 0.8
Grassy Lake	52	226	- 48	-21.2
Raymond	21	1950	-412	-21.1
Milk River	52	861	+ 60	+7.0
Warner	41	446	+26	+5.8
Coutts	65	427	- 47	-9.8
Stirling	20	390	- 78	-20.0
Fort McLeod	32	2709	+ 219	+ 8.1
Claresholm	56	2560	+ 426	+16.6
Nanton	85(56c.)	940	- 114	-12.1
Stavely	66	292	- 57	-19.5
Granum	46	295	+ 5	+ 1.7
Cardston	47	2721	- 84	- 3.1
Magrath	22	1220	- 118	- 9.7
Glenwood	55	194	- 80	-41.3
Hill Springs	65	190	- 53	-27.9

(cont'd

TABLE 3 (continued)

	distance	population 1966	change since 1966	
Lethbridge cont'd				
Pincher Creek	62	2882	- 79	- 2.7%
Cowley	71	163	+ 36	+22.1
Blairmore	89	1779	201	-11.3
Coleman	94	1507	-206	-13.7
Bellevue	87	1174	-149	-12.7
Frank	90	178	- 45	-25.3
Waterton Lakes	78	266	- 78	-29.3
Vulcan Subregion				
Vulcan	60	1505	+195	13.0
Champion	47	357	- 62	-17.4
Carmangay	39	246	- 51	-20.7
Lomond	51	215	- 29	-13.5
Arrowwood	85 (C.71)	174	- 21	-12.1
Milo	71	154	- 13	- 8.4
Calgary Region				
Cochrane	22	819	- 38	- 4.4
Airdrie	19	778	+251	+47.6%
Crossfield	29	582	- 11	- 1.8
Beiseker	46	404	44	+12.2
Irricana	40	104	- 63	-37.7
High River	39	2239	- 37	- 1.6
Okotoks	25	922	-121	-11.6
Black Diamond	38	858	-185	-17.7
Turner Valley	41	625	- 77	-11.0
Longview	49	173	(b)	
Blackie	46	156	28	-15.2
Cayley	48	133	- 13	- 8.9
Strathmore	36	994	+ 70	+ 7.6
Glenchen	60	441	+ 15	+ 3.5
Rockyford	57	281	- 7	- 2.4
Standard	56	264	- 2	- 0.8
Hussar	65	235	+ 22	+10.3
Cluny	70	171	- 3	- 1.7
Canmore	62	1445	(b)	
Banff	73	2896	-533	-15.5
Olds	58(34RD)	2999	+566	+23.3
Didburg	46(43)	1586	332	+26.5
Sundry	85(61RD)	831	- 22	- 2.6
Carstairs	38	761	+ 96	+14.4
Cremenn	53	582	+361	+163.3

Source: D.B.S., Census of Canada 1966, Advance Bulletin

b) nearly incorporated since 1961

c) other annexation of

TABLE 4

AN ANALYSIS OF POPULATION MOVEMENT AND DISTANCE TO CITY, SELECTED PLACES IN SOUTHERN ALBERTA, 1961 - 1966

Measure	All Places	Places with Population... Increase	Decrease
Towns and Villages Within 25 Miles of a City			
Number	10	23	87
Average population, 1966	1,141	712	1,324
Average change, 1961 - 1966	-49	107	-115
Relative change, 1961 - 1966	-4.3%	+15.1%	-8.7%
Towns and Villages Located 25-50 Miles From a City			
Number	25	9	16
Average population, 1966	928	1,933	563
Average change, 1961 - 1966	+45	+221	-58
Relative change, 1961 - 1966	+4.6%	+14.0%	-10.2%
Towns and Villages Located More Than 50 Miles From a City[a]			
Number	24	10	14
Average population, 1966	661	1,031 (±360)	408 (±77)
Average change, 1961 - 1966	+52	+163 (±64)	-28 (±8)
Relative change, 1961 - 1966	+7.8%	+15.1%	-7.3%
Pincher Creek - Blairmore Area, Banff and Waterton Park			
Number	8	1	7
Average population, 1966	1,356 (±399)	163	1,526
Average change, 1961 - 1966	-157 (±61)	+36	-185
Relative change, 1961 - 1966	-11.6%	+22.1%	-12.1%

Source: See Table 3.

Figures in brackets are standard errors of means.

[a] Exclusive of the eight places in the fourth group.

TABLE 5

RETAIL SALES, SOUTHERN ALBERTA, 1961

	Number of Stores	Sales ['000]	Sales per Store	Stores per 1000 Population	Sales per Capita
C.D. 1	344	37,402	$109,000	8.7	$ 955
Medicine Hat	231	32,092	139,000	9.4	1,311
Redcliff	16	746.7	47,000	7.2	336
Bow Island	24	1,495.7	62,000	21.3	1,333
Other	73	3,067.9	42,000	6.4	271
C.D. 2	665	81,297	$122,000	7.9	$ 976
Lethbridge	329	55,148	168,000	9.2	1,555
Coaldale	18	1,429.2	79,000	6.9	551
Taber	65	5,751.6	88,000	16.4	1,456
Raymond	20	2,155.6	108,000	8.4	912
Brooks	37	5,475.3	148,000	13.0	1,937
Others	196	11,337.0	58,000	5.4	314
C.D. 3	259	20,387	$ 79,000	8.3	$ 658
Fort MacLeod	43	3,660.3	85,000	17.2	1,470
Claresholm	40	2,870.7	72,000	18.6	1,340
Nanton	25	1,450.6	58,000	23.7	1,376
Cardston	40	4,449.9	111,000	14.2	1,589
Magrath	12	884.0	74,000	8.9	661
Pincher Creek	31	4,086.1	132,000	10.4	1,380
Other	68	2,985.2	44,000	3.7	164
C.D. 5	367	28,181	$ 77,000	9.6	$ 739
Drumheller	52	8,091.1	156,000	17.7	2,760
Three Hills	24	2,309.0	96,000	16.0	1,548
Vulcan	25	3,191.3	127,500	19.0	2,436
Other	266	14,589.8	55,000	8.2	450
C.D. 9	218	19,253	$ 88,000	10.7	$ 949
Blairmore	24	5,014.8	209,000	12.1	2,533
Coleman	21	1,280.9	61,000	12.2	748
Bellevue	15	912.4	61,000	11.3	690
Others	158	12,045.9	76,000	10.3	789
C.D. 2, 3, 9:	1,142	120,937	106,000	8.4	899
Others:	422	26,368.1	62,000	6.0	379

continued ....

TABLE 5 (continued)

	Number of Stores	Sales [$ '000]	Sales per Store	Stores per 1000 Population	Sales per Capita
C.D. 6	2,119	367,210	$173,000	6.6	$1,155
Calgary	1,656	329,984	199,000	6.6	1,322
Forest Lawn	56	5,599.4	100,000	4.5	457
Bowness	44	3,628.8	82,000	42.1	3,479
Montgomery	22	2,468.0	112,000	4.3	486
Sub Total	1,778	341,680	192,000	6.4	1,237
High River	49	4,709.2	96,000	21.5	2,069
Okotoks	14	1,025.9	73,000	13.4	984
Black Diamond	15	587.1	39,000	14.3	563
Olds	47	4,708.6	100,000	19.3	1,934
Didsbury	23	1,858.5	81,000	18.3	1,482
Others	193	12,640.2	65,000	5.7	374

Source: D.B.S. Census of Canada 1961, Vol. 6.1, Table 6.

TABLE 6

SELLING VALUE OF MANUFACTURED GOODS, SOUTHERN ALBERTA 1961
[$'000]

	Total	Major City	Other Places
Medicine Hat			
C.D.I.	41,509	33,522	7,987
Lethbridge			
C.D. 2	57,824	39,314	18,510
C.D. 3	4,688		
C.D. 9	6,461		
Subtotal	68,973	39,314	29,654
Calgary			
C.D. 6	285,807	253,182[a]	1,982
C.D. 5	1,763	30,543[b]	1,763
Subtotal	287,570	281,692	5,878
Total of above	398,052	354,528	43,524
Alberta Total	933,826		

Source: D.B.S., Annual Census of Manufactures 1961, Geographical Distribution (32 - 209/1961)

a) City of Calgary

b) Calgary Metropolitan Area. less city.

TABLE 7

MANUFACTURING INDUSTRY, SOUTHERN ALBERTA, 1961

Locality or industry	No. of establishments	No. of employees	Average no. of employees and establishments	Total wages and salaries [$'000]	Value of shipments[a]	Value added in mfg. [$'000]	Per employee: value added	Per employee: wages
Census Division 1	50	1996	40	7809	41509	18133	9085	3912
Medicine Hat	42	1226	29	4902	33522	13400	10930	3998
All other	8	770	96	2907	7987	4733	6147	3775
By industry:								
Bakeries	5	35	7	103	254	134	3828	2943
Soft drinks	3	16	5	60	398	227	14188	3750
Planing mills	4	9	2	20	59	28	3111	2222
Clay products	7	336	48	1324	2507	1958	5827	3940
Other	11	1600	145	6302	38291	15786	9866	3939
Census Division 2	95	2181	23	7953	57824	18604	8530	3649
Lethbridge	64	1413	22	5309	39314	13926	9856	3757
Brooks	6	53	9	158	1028	322	6075	2981
Coaldale	3	15	5	29	202	57	3800	1933
All other	22	700	32	2462	17279	4298	6140	3517
By industry:								
Butter & cheese	4	22	6	60	811	115	5227	2727
Feeds	7	34	5	98	1053	325	9559	2882
Soft drinks	3	19	6	62	416	259	13632	3263
Other foods & bev.	27	1413	52	5110	44953	12450	8811	3616
Furniture & fixt.	9	29	3	100	261	156	5379	3448
Signs & displays	4	22	6	108	207	171	7773	4909
Other	41	642	16	2420	10123	5128	7988	3769
Census Division 3	32	382	12	992	4688	1641	4296	2597
Cardston	3	4	1	8	26	17	4250	2000
Claresholm	4	21	5	55	200	86	2095	2619
Fort Macleod	5	59	12	146	347	202	3424	2474
Other urban	10	148	15	376	1684	737	4980	2540
Rural	10	152	15	407	1931	601	3954	2678

Table 7 continued

Locality or industry	No. of establishments	No. of employees	Average no. of employees and establishments	Total wages and salaries [$'000]	Value of shipments[a]	Value added in mfg. [$'000]	Per employee: value added	Per employee: wages
By industry:								
Bakeries	5	15	3	36	132	71	4733	2400
Other foods & bev.	10	131	13	193	1784	645	4924	1473
Printing & pub.	5	22	4	72	118	92	4182	3273
Sawmills	5	57	11	141	587	257	4509	2474
Other	7	157	22	449	2077	886	3732	2860
Census Division 4	7	26	4	81	425	154	5923	3115
Census Division 9	27	419	16	1695	6461	3824	9126	4045
Census Division 5	28	155	6	507	1763	847	5464	3271
Drumheller	6	33	6	95	257	158	4788	2879
Vulcan	4	15	4	41	148	83	5533	2733
Other urban	11	70	6	245	763	296	4223	3500
Rural	7	37	5	125	595	311	8408	3378
By industry:								
Bakeries	5	15	3	36	132	71	4733	2400
Other foods & bev.	7	21	3	48	409	87	4142	2286
Wood	3	7	2	15	49	24	3428	2143
Printing & pub.	6	21	4	72	160	122	5810	3428
Other	7	91	13	334	1013	541	5945	3670
Census Division 6	426	12046	28	51909	285807	99151	8231	4309
Calgary Metropolitan Area[b]	394	11917	30	51572	283825	98576	8272	4328

Table 7 continued

Locality or industry	No. of establishments	No. of employees	Average no. of employees and establishments	Total wages and salaries [$'000]	Value of shipments[a]	Value added in mfg. [$'000]	Per employee value added	Per employee wages
Remainder of C.D.G	32	129	4	337	1982	575	4457	2612
High River	4	21	5	51	229	88	4190	2428
Olds	4	19	5	51	409	114	6000	2684
Sundre	6	27	4	67	483	111	4111	2481
Other	18	62	3	168	861	262	4226	2710
By industry:								
Bakeries	4	12	3	28	106	83	6917	2333
Feeds	3	9	3	23	228	63	7000	2556
Other foods & bev.	6	33	6	87	987	130	3939	2636
Wood	12	40	4	78	381	126	3150	1950
Printing & pub.	5	20	3	63	137	99	4950	3150
Other	2	- n.a. -				- n.a. -		

Source: D.B.S., Annual Census of Manufacturing, 1961: Geographical Distribution (31-209), Ottawa, 1964.

[a] of goods of own manufacture.

[b] see following tables for details.

TABLE 8

MANUFACTURING INDUSTRY, CALGARY METROPOLITAN AREA, 1961

S.I.C. code	Major industry group or industry	No. of establishments	No. of employees	Ave. no. of employees per establishment	Total wages & salaries [$'000]	Value of shipment[a] [$'000]	Value added in mfg. [$'000]	Per employee: value added	Per employee: wages
	Total manufacturing	394	11917	30	51572	283825	98576	$ 8270	$ 4330
	City only	367	9717	26	41927	253182	83411	8580	4320
	Suburban areas	27	2210	82	9645	30643	15165	6860	4360
10	Foods & beverages	87	3789	44	15871	127846	32393	8550	4190
1010	Slaughtering	5	1254	251	6231	64659	7733	6170	4970
1053	Dairy-pasteurizing	4	720	180	2636	11321	3602	5000	3660
1051	Dairy-butter & cheese	9	49	5	160	1661	260	5310	3260
1230	Feeds[b]	3	80	10	349	3689	912	11400	4360
1240	Flour mills	3	229	76	899	14895	3711	4130	3930
1290	Bakeries[b]	40	740	18	2626	8213	4868	6580	3550
1310	Confectionary	4	12	3	31	90	52	4330	2580
1410	Soft Drinks	4	77	19	311	1979	1360	17660	4040
	Other foods & bev.[b]	10	628	63	2628	21309	9895	15760	4180
17	Leather	4	26	6	83	228	137	5270	3190
18	Textiles	7	78	11	265	2103	440	5640	3400
24	Clothing	5	89	18	217	626	335	3760	2440
25	Wood	21	389	19	1485	8101	3034	7800	3820
2510	Sawmills[b]	3	25	8	62	205	115	4600	2480
2540	Planing mills	11	236	21	911	5317	1927	8160	3860
	Other wood mfg.[b]	7	128	18	512	2579	992	7750	4000
26	Furniture & fixtures	35	263	8	940	2724	1386	5080	3570
27	Paper[b]	8	298	37	1412	8623	3789	12720	4740

Table 8 continued

S.I.C. code	Major industry group or industry	No. of establishments	No. of employees	Ave. no. of employees per establishment	Total wages & salaries [$'000]	Value of shipment[a] [$'000]	Value added in mfg. [$'000]	Per employee: value added	Per employee: wages
28	Printing & publishing	61	1140	19	4849	13409	9010	$ 7900	$ 4250
2861	Printing & bookbinding	32	291	9	1192	2684	1766	6070	4100
2862	Lithography	10	133	13	595	1595	1035	7790	4470
2871	Engraving	4	41	10	198	452	351	8560	4830
2880	Publishing only	7	12	2	47	233	106	8830	3920
	Other[b]	8	663	83	2817	8445	5752	8680	4250
29	Primary metals	8	193	24	882	11499	2235	11580	4570
30	Metal fabricating	46	1477	32	6623	20705	9269	6280	4480
3030	Ornamental metal[b]	16	383	24	1704	5213	3153	8230	4450
3080	Machine shops	11	243	22	1200	2912	1606	6610	4940
	Other	19	851	45	3719	12580	4510	5300	4370
31	Machinery	5	85	17	397	1584	695	8180	4670
34	Non-metallic mineral	25	785	31	3283	15110	7104	9050	4180
3470	Concrete products[b]	13	326	25	1305	4814	2845	8730	4000
3480	Ready-mix	3	185	62	958	4498	1385	7490	5180
	Other	9	274	30	1020	5798	2874	10490	3720
37	Chemical[b]	14	503	36	2616	11232	6135	12200	5200
38	Miscellaneous	45	252	6	1014	2309	1628	6460	4020
3815	Dental labs	13	39	3	155	265	207	5310	3970
3970	Signs & displays	15	131	9	583	1422	1017	7760	4450
	Other miscell.	17	82	5	276	622	404	4930	3370
	Other Industries								
3240	Truck body & trailers	5	94	19	272	915	493	5240	2890
	Other[bc]	18	2446	136	11366	56811	20545	8400	4650

Source: D.B.S., Annual Census of Manufacturing, 1961, Geographical Distribution, Ottawa, 1964.

[a] of goods of own manufacture.

[b] Includes establishments located in suburban area. See table 8a.

[c] Includes Petroleum and Coal Products, Electrical, Transportation Equipment Industries and others.

TABLE 8A

MANUFACTURING INDUSTRY CALGARY METROPOLITAN AREA LESS CITY OF CALGARY, 1961

S.I.C. code	Major industry group or industry	No. of establishments	No. of employees	Ave. no. of employees per establishment	Total wages & salaries [$'000]	Value of shipment [$'000]	Value added in mfg. [$'000]	Per employee: value added	Per employee: wages
	Total manufacturing	27	2210	82	9645	30643	15165	$ 6860	$ 4360
10	Foods & beverages	8	62	8	206	1099	477	7690	3320
1230	Feeds	2	n.a.						
1290	Bakeries	4	24	6	64	180	98	4080	2670
	Other foods & bev.	2	n.a.						
25	Wood	5	36	7	101	332	180	5000	2810
27	Paper	1	n.a.						
28	Printing & publishing	1	n.a.						
30	Metal fabricating	4	97	24	424	1720	825	8500	4370
3030	Ornamental metal	2	n.a.						
3080	Machine shops	1	n.a.						
34	Non-metallic mineral	3	89	30	313	1167	620	6970	3520
3470	Concrete products	3	89	30	313	1167	620	6970	3520

Source: See Table 1.

TABLE 9

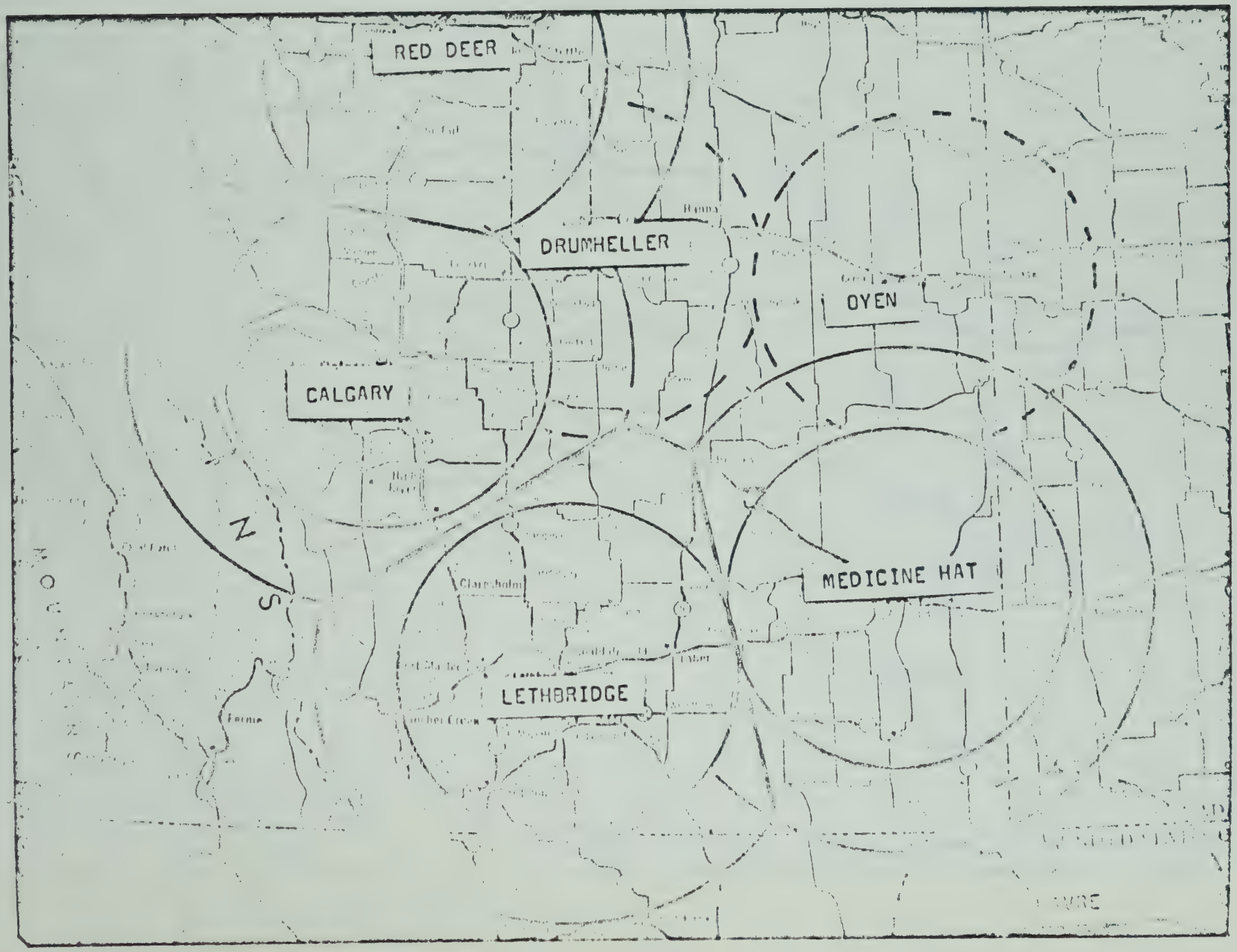
COMPARATIVE STATISTICS, MANUFACTURING INDUSTRY, SOUTHERN ALBERTA, 1961-1964

		C.D.1	C.D.2	C.D.3	C.D.5	C.D.6	C.D.9	Six C.D.s	Alberta
1.1 Number of establishments	a	46	117	33	29	476	24	725	1746
	b	93.9	121.0	100.0	103.6	111.7	92.3	110.2	107.2
	c	2.6	6.7	1.9	1.7	27.3	1.4	41.5	100.0
1.2 Number of employees	a	2005	2520	594	142	11834	475	17670	43517
	b	98.0	114.6	158.8	118.3	104.6	123.0	106.8	109.2
	c	4.6	6.0	1.4	0.3	27.2	1.1	40.6	100.0
1.3 No. full-time equiv.prod.workers	a	1475	1876	436	94	7355	354	11590	28014
	b	98.8	115.0	188.3	158.2	104.6	117.6	107.7	123.0
	c	5.3	6.7	1.6	0.3	26.2	1.3	41.4	100.0
1.4 No. working owners & partners	a	27	55	17	25	185	11	320	782
	b	100.0	112.1	100.0	75.8	98.9	84.6	98.2	87.5
	c	3.4	7.0	2.2	3.2	23.6	1.4	40.9	100.0
1.5 Value of shipments	a	59626	93334	9390	2456	348611	8125	521542	1193780
	b	145.8	160.6	190.3	159.3	125.9	132.3	134.2	127.6
	c	5.0	7.8	0.8	0.2	29.2	0.7	43.7	100.0
1.6 Value added	a	25181	29038	3604	1126	128491	5412	192852	454935
	b	135.6	154.4	181.9	126.1	126.5	246.6	132.5	127.3
	c	5.5	6.4	0.8	0.2	28.2	1.2	42.4	100.0
1.7 Return to cap. & mgt.	a	16304	18229	1879	507	72649	3403	112976	254873
	b	155.3	176.8	187.7	105.2	138.8	159.9	147.2	134.6
	c								100.0
2.1 Employees per establishment	a	44	22	18	5	25	20	24	25
	b	105	92	150	80	93	133	97.0	101.6
	c	176	88	72	20	100	80	98	100.0

Table 9 continued

		C.D.1	C.D.2	C.D.3	C.D.5	[illegible]			
3.1 Value added per works	a	$12300	10860	5900	6740	10690	11140	10720	10270
	b	138.3	134.8	120.5	116.5	121.0	120.4	124.1	117.0
	c	120.2	105.7	57.4	65.6	104.1	108.4	104.4	100.0
3.2 Value added per $ of shipment	a	$ 0.42	0.30	0.37	0.39	0.35	0.66	0.35	0.36
	b	92.7	96.6	90.9	79.2	0.08	110.8	97.2	98.7
	c	116	83	102	107	96	182	96	100.0
3.3 Employment coefficient	a	94.7	93.8	88.2	98.6	95.2	94.8	94.6	95.8
	b	99.8	98.8	114.8	125.8	102.4	101.1	101.7	102.9
	c	99	98	92	103	99	99	99	100.0
4.1 Average hourly wage	a	$ 2.05	1.93	1.36	1.84	2.13	1.97	2.05	2.01
	b	114	117	99	106	106	99	108.0	106
	c	102	96	68	92	103	98	102	100.0
4.2 Annual average earnings	a	$ 4427	4126	2904	4359	4710	4219	4520	4597
	b	112.2	111.0	114.7	127.3	108.4	104.4	108.8	109.2
	c	96.3	89.8	63.2	94.8	102.7	91.8	98.3	100.0
4.3 Annual ave. withdrawals	a	$ 4777	4727	3765	3840	4140	3727	4238	3836
	b	159.2	107.2	108.5	121.8	114.5	115.4	117.3	118.3
	c	124.5	123.2	98.1	100.1	107.9	97.2	110.5	100.0
4.4 Return to cap. & mgt., per worker	a	$ 8024	6814	3075	3036	6044	7012	6280	5753
	b	158.4	154.4	124.1	96.4	132.7	131.3	137.9	123.7
	c	139.5	118.4	53.4	52.8	105.1	121.9	109.2	100.0

Source: D.B.S. Daily Bulletin Supplement, Advance Statement No. 2. n.d. [1967].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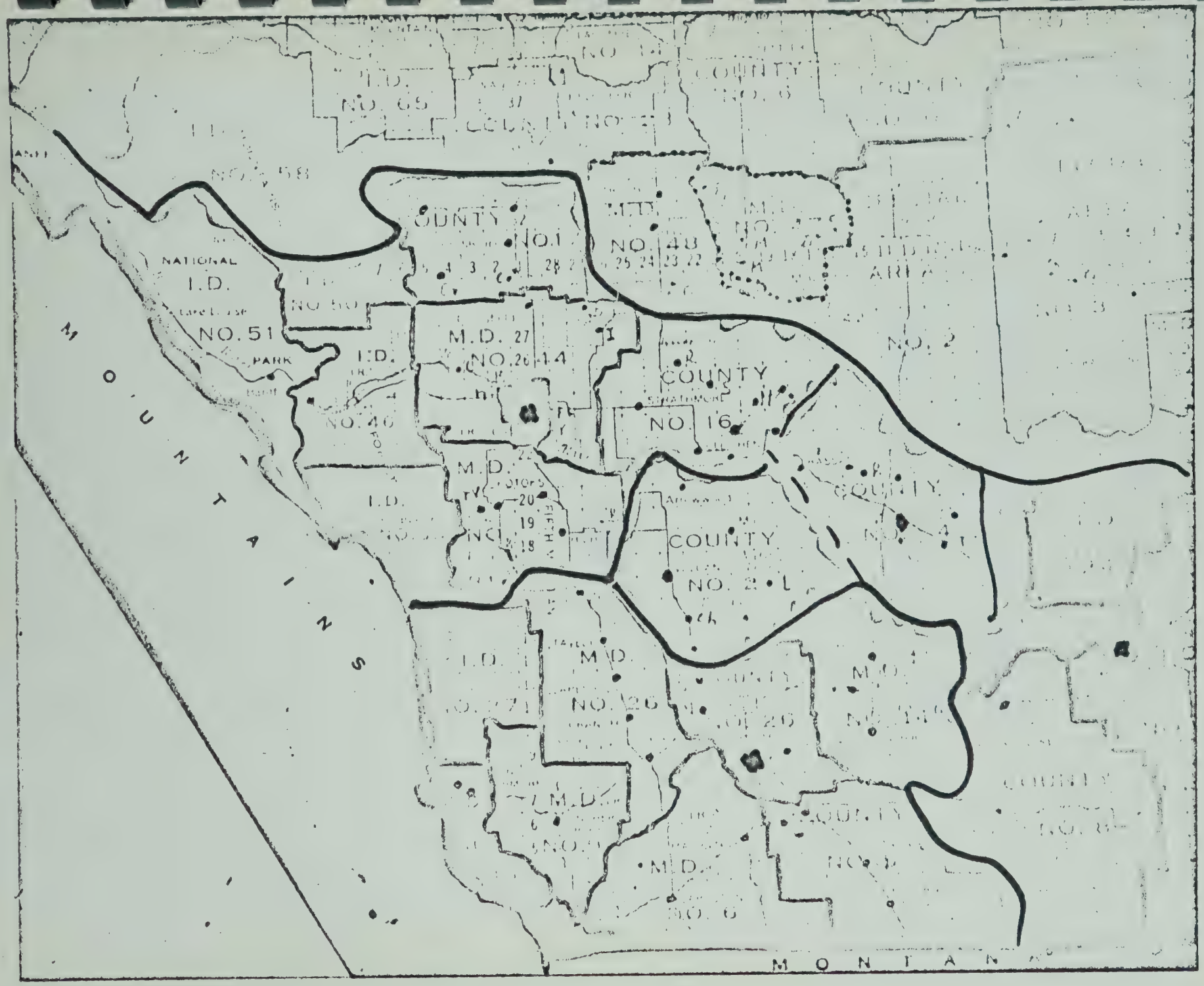
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EXHIBIT 10

A DESCRIPTION AND ANALYSIS OF ADULT EDUCATION IN SOCIAL AND ECONOMIC DEVELOPMENT WITH SPECIAL REFERENCE TO EASTERN WASHINGTON

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Introduction

Adult Education is a newly revitalized field in American Society. While it is true that for many decades there have been some revenues available for continuing education beyond formal school curricula, the opportunities have been spasmodic. Frequently, those who need further education and training the most have been least able to participate.

Recent attempts to analyze the poverty problem and to isolate the reasons for individuals becoming spun out of society, have created at least some awareness of the need for a more universal continuing education program for adults. This becomes especially important in a rapidly changing and increasingly complex society brought about largely by the effects of new technology. While society is coming to realize that individuals in certain types of employment may require retraining as frequently as two or three times during their lifetime, there is still a general lack of appreciation for the more important need for the type of education which will develop the motivation and decision making ability in people, so that they can guide their own destiny as opportunities do become available. It is well recognized by researchers into the conditions of poverty, that poor communities usually have more assistance programs available to them than they know how to mobilize. Therefore, it would be naive to suggest that the primary requirements for the alleviation of poverty are skill training and job opportunities alone, although these are essential ingredients.

Thus, an adequate set of programs in adult education is much more complex than one would first envision. This paper will attempt to define the scope of Adult Education, and outline the urgent reasons for a better coordinated and more extensive emphasis on it. References will

be made to research studies and judgements (because much of our information is still at this stage) concerning the benefits of adult education to individuals and society. A listing of available Adult Education programs in Washington will then be outlined, together with statistics, to show the actual participation of eastern Washington counties. Concluding remarks will compare the actual situation with a more optimum set of adult education programs, based on some of the trends outlined above.

The Scope of Adult Education

The scope of Adult Education is not easily defined. Adult educators themselves have held widely differing opinions on what should be classed as Adult Education. The casual observer would rightly classify all of the formally structured evening courses and special vocational training programs offered by educational institutions as adult education. However, the real scope of adult education has for too long, been overshadowed by this narrow attitude of educators and policy makers in education. A much broader and more acceptable starting point is to define Adult Education as a process which changes attitudes and skills of people. With this philosophy, it will be easier to classify the scope of Adult Education into a workable definition which can be used to assess the needs for programs and the levels of adult education in an area.

It is a mistake to assume that poor people are waiting with open arms for help. Many (but certainly not all) fail to recognize or admit that they are poor. Others have given up all hope, and are no longer

motivated to recognize opportunity, and to make rational decisions toward reshaping their personal lives. In some hard core poverty cases, individual counselling, frequently with the mother of the family unit, is the only conceivable way of getting the family off dead center at a low level of equilibrium. Thus, there are frequently many more opportunities and alternatives available to a family and a community than the individuals know how to use. This has been adequately demonstrated in a number of forward looking area development programs, where informal educational devices have led to local decision making on local problems, rather than the customary practice of handing down assistance programs on a "take it or leave it" basis, which merely generates paternalism.

So with a broader approach to Adult Education, it becomes obvious that if the task is one of changing attitudes and skills of people the educational process will involve not only basic education and skill training, but also the whole range of phenomena which help to change attitudes. These, of course, are not separate and distinct segments of the learning process, but are in fact closely knit and complementary to each other. Bergevin[1] states:

> Adult Education has an important general purpose: to discover and present to the adult, the opportunity to advance as a maturing individual, and to help him learn how to contribute his share to the civilizing process.
>
> ... Adult education must, then, have a purpose greater than that of learning the skills of the craftsman and the physician and the entrepreneur, important as these are...
>
> ... If we consider adult education any type of learning that alters the way we think about something, changes the way we behave, or adds to our supply of information and knowledge, then the responsible programs are only part of the vast area included in

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[1] A Philosophy for Adult Education, Paul Bergevin, Seabury Press, New York, 1967.

> the area called adult education. ...Adult Education is anything which will help a person control his own destiny. ...Adults are not just grown up children, and they do not learn like children. Thus, we have made some terrible mistakes by merely extending the facilities and teaching methods for children into the adult world.

Bergevin[2] goes on to summarize the characteristics of good Adult Education, which are: (1) most adult education programs should be voluntary, (2) needs of the learner must be discovered and met, (3) appropriate resources, (4) problem centered learning, (5) programming should be a cooperative effort between teachers and the local learners, and (6) should be carried out in the environment in which the learners exist

Numerous other quotes can be cited from literature written by professionals in the field of continuing education. All make a plea for a broader approach to the existing Adult Education programs. Biddle[3], for example, says:

> The idea that men might lift themselves into a good society is taking on new life. Hopeful attitudes grow, in part, out of well financed programs to eliminate poverty, ignorance, bad health and housing, and other social evils. But many of these proposals have a discouragingly familiar ring. Reformers have tried to purchase a way to Utopia. Hopefulness arises more out of the possibility that people can be encouraged to help create a better social order. ... The new emerging methodology of community development supports the conviction that social improvement does not occur until the people involved believe that improvement is possible.

Thus, there is a growing body of literature based on firsthand research and experience which shows that motivation (reactivation of local initiative and democracy) is a prerequisite to socioeconomic progress for most poverty areas, a phenomenon to which many economists still are loathe to admit, because it does not seem to belong in their sacred territory

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[3] Ibid.

[4] Community Development Process, Biddle & Biddle, Holt Rinehart & Winston, 1965.

staked out in the area of economic development. There are numerous examples to point out the futility of merely re-distributing income to underprivileged groups without accompanying educational programs. Prime examples are the Indians of Alberta and Montana, where oil discoveries have made Band Councils wealthy. New houses built by the Councils now frequently stand empty with broken windows as many retreat to their former ways of living. Drunkeness and other antisocial behavior has increased. Most of us have also observed individuals who suddenly come into money through inheritance or sweepstakes, or the behavior of slum dwellers who move into modern housing.

Given the above assumptions concerning Adult Education, it is obvious that its scope is considerably wider than merely an extension of the existing formally structured school system to include adults. On the other hand, however, if we take the attitude that Adult Education is any process which changes attitudes and skills of people, its breadth would cover such a wide range that a definition would be useless insofar as a working concept is concerned. For the following discussion and listing of continuing Education facilities in eastern Washington, Adult Education is considered to include formal and informal educational and social action programs sponsored by a public agency for people who are presently employed, or unemployed but not in a position to go to grade school, college or university. It can be divided into three classes:

1. Basic Education -- such as reading, writing and arithmetic

2. Social Action Education -- which would include the behavioral sciences and liberal arts as a background for motivational development and attitude change, leadership education, etc.

3. Skill Training Education -- which includes vocational training and apprenticeship programs.

This definition allows for a number of public programs which we might not normally think of as being part of Adult Education, but still allows a cut-off point from many of the activities which also lead to human development, but in a much smaller, or different sense. It would thus preclude such institutions as churches, taverns, public libraries, and service organizations which are alleged to provide spiritual, cultural and leadership development.

Adult Education Needs -- Why and Who

Perhaps economics and its past dedication to the price system and things which are measurable in dollars, and thus "researchable" has short changed society and itself. In economic analysis, the human factor is considered an important input to economic activity. However, the National Accounts fail to measure the state of human capital along with the other stocks of money, inventory and equipment. In the book called "Economic Development -- Past and Present" by Gill[4] he states:

> A country's capital is its stock of produced or manmade means of production, consisting of such items as buildings, factories, machinery, tools, equipment and inventories of goods in stock. ... However, the term "capital" is used in a number of ways... tangible capital on one hand, and intangible on the other. We should not allow ourselves to forget that there is in every

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[4] Economic Development -- Past and Present, Richard T. Gill, Prentice-Hall, 1964.

> society, a very important kind of intangible capital -- its accumulated stock of knowledge, skills and know-how, which may play quite as important a role in economic development as its more palpable twin.

Like many books on economic development, this is the last time he mentions the role and importance of human capital stock. Perhaps if a measure of the state of human capital were in fact included in the national accounts, society would be more aware of, and policy makers less reluctant about making substantially greater and systematic investments toward increasing the human capital stock. Furthermore, investments might be researched and made on an opportunity cost-equimarginal basis, where the returns above costs to society would be the greatest. This might well be in low income-poverty areas, thus justifying the social expenditure on an economic basis rather than just a moralistic one. It would also point out to society that most aspects of education might well be considered a productive rather than a consumptive item, and thus worthy of full social support.

There is some intuitive evidence to show that the marginal returns to society from upgrading the education in low income areas, might well be higher than investment in education in high income areas. Unfortunately there is little research which measures the dollar value of this hypothesis (although there has been research done on the dollar value, not considering income levels of the learner, as a variable). It would seem logical, however, that training of a low income worker might increase earnings proportionately more than that for higher income workers. This is a many sided argument however, and involves not only higher earning potential, but also his increase in worth as a decision making

citizen in non-monetary areas, the amount of welfare payments saved as a result of he and his family becoming self-supporting, and so on. This would be a very useful research area.

It would seem, however, that inasmuch as poverty areas and families tend to be self-perpetuating, any investment in education to break this cycle, would create a benefit stream to society well into the future, certainly much larger than the gains to the trained person and his family alone.

Special Problems In Adult Education

While one could thus hypothesize that the poorer a community, the greater the need, and the benefits to the individuals and society, it should not be forgotten that people who become involved in so-called "poverty programs" at the teaching, administrative and policy level, badly need adult education programs to meet their own needs for successfully working with socially and economically disadvantaged groups. This means retraining in skills required to effectively communicate with disadvantaged people and empathize with them. It involves a change in attitude toward the poor. The whole philosophy of education in poverty areas has emphasized training the poor so that they can acquire skills to secure employment on the lower end of the socioeconomic ladder, rather than helping them to become participating citizens. Antipoverty training programs designed by the upper middle class are designed neither to a social movement among the poor, nor a social action effort by the poor. Often the visible rewards to the poor are insufficiently clear.

Haggstrom[5] states:

> The fact that educational programs are controlled and extended by affluent outsiders to poverty, means that the programs reflect other concerns of the educators than the provision of education. The poor are also taught to be docile and not to endanger public safety or the public treasury. In other words, a major object in educating the poor is to control them, while the purpose of education of affluent adults is their self-realization. But social control from outside interfers with enabling poor adults to assume self-responsible adult roles, and thus reduces their motivation for being educated at all.

Haggstrom is really indicating that poor people need the education and assistance to organize and gain power. This is why Peace Corps and Vista workers are required to participate in human relations training sessions prior to active duty. However, their success in motivating and educating the poor for social action, is doomed to certain failure unless their administrators go through the same experience. Consequently, most organized attempts at social action by the disadvantaged has to date been squelched, sometimes forcibly, with the accusation that the particular community development worker responsible was either a communist or an irresponsible moron. Furthermore, opposition to the organization of the poor is resisted not only by unknowledgeable development administrators, but also by vested interest groups such as landlords and incumbent politicians, who stand to lose personally by any change in the power of the poor.

Thus, the future for the needed type of Adult Education in poverty areas is rather dim. The policy will likely continue to be one of providing training funds with strings attached, but not of a broad enough nature to threaten the status quo.

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[5] Poverty and Adult Education, Paper by Warren C. Haggstrom, Ph.D., given at the National Conference of the Adult Education Association, Milwaukee, 1964.

Adult Education -- Who Should Pay

In spite of a moderating trend in the old neoclassical doctrine of benefit distribution, there is still a rather strong public criterion that people who benefit from certain amenities should be prepared to pay for them. Thus, much of our education is said to be financed through subsidization, the balance being financed locally through taxation and enrollment fees. There is much argument about the fairness of taxation for education. Urban dwellers feel they are subsidizing rural areas. Rural areas make a case for the opposite view. Affluent areas of the country object to federal transfers of money for education to poorer areas.

Most of these arguments are based on the assumption that the individual and his particular community receive most of the benefits from such items as training specifically, and education generally. There is also a general assumption on the part of most citizens that because of the apparently large amounts of subsidization in education, all areas in a democracy like America have equal learning opportunities.

Are these assumptions true? Several pieces of research have been done concerning each assumption. John Zimmer[6] of the United States Department of Agriculture recently completed a study of the poverty status of all counties in the USA, in relation to their relative educational standards. He found that not only did poor counties raise a smaller amount of taxes locally as a percentage of per capita income,

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[6] Quality of Education in Counties Classified by the Relative Poverty States of Their Rural Population, John M. Zimmer, American Farm Economics Association Meetings, Guelph, Ontario, 1967.

but the federal assistance was based on a dollar matching basis. Thus, the per capita budget for education in these counties amounted to only a little over 50 per cent of that available in the most affluent ones. Thus, equal educational opportunity is a myth. While this study was for public school operation, many Adult Education programs follow the same method for funding.

What about the assumption concerning the destination of benefits from education and retraining? M.E. Borus[7] in his doctoral research took the economic benefit-cost approach toward measuring net benefits of retraining. He selected a sample of trainees under a Manpower Development and Training Act project along the New England seaboard, and compared their performance with a similar group which did not elect to take the training program. He appraised the economic net benefits to society, to the federal government, and the individual. Social and psychological benefits were omitted on the assertion that they were not measurable.

Borus found that in his research, the benefit-cost ratio in favor of the total economy was in the range of 75 to 100. For the federal government the figure was 15 to 20, while for the individual, the ratio was in the vicinity of 3 to 6. These startling results were obtained after a great deal of detail in netting out any offsetting factors including opportunity costs.

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[7] Benefit-Cost Analysis of the Economic Effectiveness of Retraining the Unemployed, M.E. Borus, Yale Economic Essays, 1964.

Gerald Somers and Ernst Stromsdorfer[8] conducted similar research on a group of trainees in three depressed West Virginia communities in 1963. Results from their work indicated that the average trainee completing the courses would make up the total costs of his re-training in about 6 months, while society would recover its costs in approximately 13 months, again indicating a large payoff in favor of training. (They do mention, however, the problem of dropouts from the courses, with almost half not finishing). By the use of a 4 per cent discount rate, they estimated that the present value of future net income increases would be $3,150 per trainee, and similarly for society, the net gain would be $6,640 under the given assumptions.

If these results can be generalized to the whole economy, it becomes evident that for its own benefit, society as a whole has a large stake in providing funds for education and training. If it is also true that societal gains are greater than government gains it would appear justifiable and reasonable to increase local taxes and outlays for subsidized education and training.

Another problem about which many people, especially urban dwellers complain, and about which there is much confusion is that of the assessment of regional benefits from training. Trained people tend to migrate from low opportunity areas. Therefore, these areas derive only partial benefit from improvements in training and education of their inhabitants. Thus, the costs should not be borne exclusively by money raised in these areas. Since the benefits of training are shared by the more affluent

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[8] Benefit-Cost Analysis of Manpower Retraining, Gerald G. Somers and E.W. Stromsdorfer, Proceedings of Industrial Relations Research Association, Chicago, Illinois, 1964.

areas, they should legitimately share in the expense. This is a straight economic fact and not even a moral issue under the above reasoning. More information and a better understanding by society in general is needed here.

Thus, in conclusion it appears safe to say that even if we assume that those who benefit from education and training should pay, there appears to be sound evidence to indicate that a great amount of re-distribution of the educational tax load toward society in general, and affluent highly developed areas in particular would not be violating this criterion.

Adult Education Resources Available in Eastern Washington

There is no shortage in the number of adult education programs available in Washington. Their mobilization, size and effectiveness is another matter. It appears that the need for education and training for those outside of the formal school system has been recognized by different agencies at various times. Consequently, the existing adult education scheme suffers from almost an unbelievable patchwork of criss-crossing programs poorly or completely un-integrated. Thus, assistance programs flow into the county or community level from as many as a dozen or more sources and under many more project titles. Many communities do not know how, or do not have the initiative to struggle through the maze of administrative obstacles to take advantage of available resources.

Available adult education assistance is forthcoming from the Federal Government in amounts which have recently been markedly increased.

Generally, the state supplements these by widely varying ratios, depending on the particular program. In special instances, county funds make up the balance. This is true of the Cooperative Extension Service and some of the adult education programs originating in county high schools and community colleges.

There are, however, several important federal acts under which most of these programs fall. These are listed as follows, indicating the appraised annual amount allocated by the Federal Government for all states in 1967.

		Annual Amount (millions)
1.	Smith-Hughes Act of 1917 -- approximately half for agricultural vocational training and half for industrial and home economics.	$7.2
2.	George Barden Act of 1946 -- added to the Smith-Hughes Act to be used on same pro-rata basis, except scope enlarged to include distributive trades.	$28.5
3.	Public Law 84-1027 of 1956 -- added the fisheries industry to the Barden Act.	$ 0.4
4.	Health Amendments Act of 1956 -- added to the Barden Act for training in practical nursing.	$ 5.0
5.	National Defense Education Act of 1958 -- Further amended the Barden Act to include assistance for training highly skilled technicians.	$15.0
6.	Area Redevelopment Act of 1961 -- Provides assistance for training or retraining unemployed or under-employed persons in redevelopment areas.	$ 4.5
7.	Manpower Development and Training Act of 1962 -- A four-year program, which has been extended. It includes training similar to that of ARA, but is not limited to redevelopment areas. The first four-year program allotment was 950 million.	$240.0

	Amount (million)
8. Vocational Education Act of 1963 -- added to the Smith-Hughes and subsequent supplemental ones such as the Barden Act. It recognized that in some states, the above funds were primarily used for agricultural vocational and home making training. Its funds are available for the complete range of vocational training, stressing the service industries and allows for instructors salaries and equipment. The 1968 appropriation is	$223.0
9. Smith-Lever Act of 1914 -- For the stated purpose of agricultural and home making extension to assure (a) an abundance of food and fibre, (b) a family system that involves the home as an effective social and economic unit and (c) leadership development. Estimated funds for 1960[9] were (1) Federal Extension	$ 2.3
(2) Federal Grants to States	$ 53.7
10. Rural Area Development (RAD) -- (estimated portion considered adult education)	$ 3.0
11. Economic Opportunity Act of 1964 -- is intended to be a coordinating and unifying force for all other assistance programs. In the field of adult education as defined above, it deals with such social action projects as Community Action Programs, Vista, Neighborhood Youth Corps, and more directly educational programs such as Adult Basic Education, Work Experience, Job Corps, Migrant Education Programs. The 1967 expenditure in adult education was	$1,484.0
Thus, the total estimated Federal Assistance is	$2,066.6

[9] The Cooperative Extension Service, H.C. Sanders, Prentice-Hall, 1966.

This is without a doubt a very conservative estimate, as such items as library and cultural grants have been omitted. These programs offer assistance bordering on adult education as defined in this paper. Also, it does not include the amounts contributed at the state and local levels, or that made up by participants through enrollment fees, but is strictly a portrayal of Federal contributions. These assistance programs are all available to Washington. They are all being used. The first five listed, and also items 7 and 8, are being used chiefly through high schools, vocational and technical schools, and community colleges, and Washington State University for Vocational Educational instruction. The Department of Public Assistance utilizes the ARA program while MDTA is administered by the Vocational Education Division of the state government. It allocates monies from MDTA to community colleges and technical schools, as well as private concerns such as Boeing Aircraft Corporation. RAD was used for social action education in Stevens County some 10 years ago. Three resource persons were supported by Federal funds in the Stevens County pilot project. Its use in education now is minimal, most of the funds going for smaller technical assistance projects in Washington.

The Economic Opportunity Act is presently being used as support for a rather extensive social action program throughout Washington State. A state director and a small supporting staff have been hired and are located in Olympia. The director is Byron Brady. The basic approach being used is the establishment of local Community Action Association consisting of volunteers at the county level, with perhaps

a paid manager and secretary. These associations are funded by the Economic Opportunity Act, but much of the capital and labor is acquired locally. The Office of Economic Opportunity will, however, finance certain educational projects up to 100 per cent, either through its own budget, or from budgets of the other listed federal acts.

Brady states:[10]

> Community Action Programs enable communities to attack their local poverty problems in a positive and coordinated manner. The programs, developed and administered by the community, may include remedial reading, literacy instruction, job training, employment counselling... No poverty program in this state advocates such radical solutions as redistribution of the wealth or a guaranteed annual income. No poverty program in this state extols dole welfare systems and massive unemployment compensation as anything but temporary protection against the effects of poverty. It is now generally accepted that such traditional means frequently have miscredited our efforts away from real solutions. We now realize that such programs do little to promote feelings of self-worth or to release talent to make a productive contribution to society.

If one omits the political overtones and the apparent belief that all poverty problems can be solved locally, there is a basic truth in his statement. Such Community Action Associations could, in fact, be very effective in coordinating and mobilizing available funds for the community. They could also go a long way in revitalizing local motivation and promoting leadership development.

Adult Education in Eastern Washington

Counties included in this survey are all those east of the Columbia River, plus Ferry and Okanogan counties but excluding Spokane, making a total of 14. Statistics for adult education programs on an area or county basis are virtually impossible to obtain.

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[10] A Statistical Report of Washington's "War on Poverty", B.E. Brady, Governor's Office of Economic Opportunity, Olympia, Washington, January 1967.

Administrative boundaries differ widely. There are large areas of overlap as well as voids. Fiscal accounting years for the various agencies using the same programs differ, and specific program expenditures are buried in aggregated financial statements. This is a further indication that adult education is poorly coordinated. In an attempt to arrive at a very rough estimate, table I has been constructed through the application of some broad assumptions.

Cooperative Extension figures have been estimated on the basis of $20,000 per county professional staff member. This includes an allowance for extension specialist backing of the state's 70 specialists. About one-third of the total state county extension staff is located in the counties being examined. The above procedure checks fairly closely with the total state extension annual budget of approximately $3.5 million. Washington State University General Extension has been omitted as its effect is insignificant in counties other than Whitman and Spokane which has been deleted because it is heavily urban. The Department of Public Assistance is assumed to administer mainly ADA monies plus some of its own for training of disadvantaged persons on welfare. The State Division of Vocational Education figures include estimates of MDTA and Vocational Education Act funds plus some of their own. Adult education directly financed through the schools as "auxiliary services" in the annual report of the Superintendent of Public Instruction has been included. Community Action figures are taken from statistics of the OEO office in Olympia.

Table II

Appraisals of Annual Expenditures from Public Sources on Adult Education in Eastern Washington by County[1]

County	Population 1960	Per cent rural	Median School Years -Male- 1960	Annual Expenditures (dollars) School Districts	Department of Public Assistance	Community Action Assoc.'s	Vocational Educational Act	M.D.T.A.	Cooperative Extension	Total Expend.	Dollar Per Person
Adams	6,584	73	11.7	8,750	2,348			21,000	100,000	132,098	20.00
Asotin	10,878	25	11.0	253	3,384	24,600			40,000	68,237	6.00
Columbia	4,860	36	10.5	545	3,972	12,279			20,000	36,796	7.90
Douglas	10,817	100	11.3	1,302	1,848	8,241			40,000	51,391	5.00
Ferry	4,096	100	9.7	1,915	798			21,000	60,000	83,713	20.40
Franklin	13,563	26	12.0	12,791	39,033	20,721	753,724	126,000	80,000	1,032,269	76.00
Garfield	2,976	100	12.3	839	433				20,000	21,272	7.10
Grant	24,346	54	12.1	32,110	45,232	12,652	220,474		200,000	510,468	21.20
Lincoln	10,970	100	12.2	163				21,000	80,000	101,163	9.30
Okanogan	29,131	78	11.7	13,494	6,760	11,375	9,930		100,000	141,559	4.90
Pend Oreille	7,413	100	11.2	221	344			21,000	20,000	41,565	5.60
Stevens	18,580	79	11.3	5,131	1,891			21,000	40,000	68,022	3.70
Walla Walla	40,135	32	12.1	14,069	39,823	12,279			80,000	146,171	3.65
Whitman	32,649	50	12.4	1,427	182			21,000	80,000	102,609	3.10

[1] Figures are the most current available, but are not all for the same year. Cooperative Extension Service and Community Action funds are for 1966-67. Department of Public Assistance funds are for the year 1967 while School District funds are for the year 1965. Vocational Education and MDTA funds are for the fiscal year 1967-68. Sources are the Cooperative Extension Service, Pullman, Washington, Department of Public Assistance monthly statistics, the Biennial Report of the Superintendent of Instruction, and direct communication with the Division of Vocational Education, Olympia, Washington. Where necessary, arbitrary allocations by county were made.

The broad estimates have then been totalled by county, and by source of finance. Furthermore, an estimate of public expenditures on adult education per person by county has been calculated. It should be emphasized that there is a large amount of overlap which extends beyond county boundaries. Franklin and Grant counties show much higher per person expenditures because they contain the only two community college complexes of all the counties surveyed. Furthermore, Whitman county population is inflated by university students at Pullman. Ferry county contains county extension specialists who provide services to both Stevens and Okanogan counties, thus accounting for the high figure of $20.40 per person. At the same time, it should be pointed out that one of the prerequisites of a good retraining program is that facilities should be close to those who need training inasmuch as many potential trainees have families and frequently, parttime employment.

Table II is set up to analyze the educational levels of males over 25 years of age, by county. Those with grade eight education or less were listed as a percentage of the total. Whitman county had the lowest proportion at 25 per cent, while 45 per cent of the males in Ferry county had a grade eight education, or less.

Some interesting observations can be made by comparing the per capita expenditure on adult education on a county basis, with the corresponding levels of education for males over 25. The counties which had the highest percentage of males over 25 with educational levels at grade 8 or lower were Columbia, Ferry, Lincoln, Okanogan, Pend Oreille

Table II

Analysis of Education of Male Population Over Twenty-Five by County

Source: (Population Census, 1960)

County	Total Males over 25	Elementary Schooling (years) None	1 to 4	5 to 7	8	8 and less	Grade 8 or less	Man years of[1] needed train.	Added Training Costs[2] (000)
		- - - - - - - - - - - - numbers					%	$	$
Adams	2,656	26	87	264	616	993	38	1986	3,972
Asotin	3,481	22	171	314	817	1,324	39	2648	5,296
Columbia	1,370	0	41	195	332	568	42	1136	2,272
Douglas	4,047	8	136	396	857	1,397	35	2794	5,588
Ferry	1,090	8	52	168	252	480	45	960	1,920
Franklin	6,125	58	192	516	969	1,735	29	3470	6,940
Garfield	840	4	13	102	172	291	34	582	1,164
Grant	11,870	49	369	874	1929	3,221	27	6442	12,884
Lincoln	3,215	10	211	339	776	1,326	42	2652	5,304
Okanogan	7,171	77	280	918	1684	2,959	41	5918	11,836
Pend Oreille	2,046	13	104	273	523	913	44	1826	3,652
Stevens	5,061	44	195	758	1426	2,423	48	4846	9,692
Walla Walla	12,749	119	531	1345	2325	4,320	34	8640	17,280
Whitman	7,560	28	236	414	1213	1891	25	3782	7,564

[1] Assume an average of two years per person for those with eight grades of school or less.

[2] Estimated at $2,000 per year -- Assistant Deputy Administrator of Manpower, Department of Labor.

and Stevens. All of these counties had more than 40 per cent in this category. With the exception of Ferry county, all of these counties expended fewer dollars on adult education per person than the average for all the counties. Excluding Ferry county, these counties spent $6.30 per person while for all of the counties surveyed the average was $12.35. Thus, those counties needing adult training the most expended only one-half of the average per person for all of the counties in eastern Washington. This is a similar result to that obtained by Zimmer[11] for public school education in low income counties. Thus, there appears to be a strong indication that disadvantaged counties tend to have not only lower formal educational budgets, but also fewer adult educational programs.

A further computation has been made in table II to arrive at an estimate of up-grading the basic education and skills of those males over 25, who had a grade 8 educational level or less. The assumption was made that on the average these individuals would need a year of basic education, plus a year of skill training. The Assistant Deputy Administrator of Manpower of the United States Department of Labor[12] has estimated that on the average it requires $2,000 per year to train an adult, considering all of the factors involved such as travel and living allowances. Applying this figure to the man years of education required to provide all of those having a grade eight or lower educational level with two more years of training, the surveyed counties of

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[11] Op. Cit.
[12] Op. Cit.

eastern Washington would require a lump sum budget of $85,364,000. This estimate faces a number of shortcomings. Some of those over 25 are too old to become productive through further training, while others are gainfully employed with satisfactory incomes. However, it does point out the amounts of money which are required if the human capital stock of a region is to be upgraded through education and retraining.

Another observation from table II shows that a number of counties are not making use of such available programs as the Community Action Associations, or the Vocational Education Act. These tended to be those where educational levels of adults were low. This supports the hypothesis that disadvantaged counties may not have the leadership or motivation to harness such programs for their benefit.

Summary

Adult education and retraining needs are being recognized by a number of people and agencies, with the results that growing attention and financing is being created. Generally the concept of education for adults has been, and still is, relatively narrow, being limited largely to skill training. Some newer programs, however, are stressing the broader aspects of general education and leadership training which is required if individuals and their communities are to grow and make constructive contributions to society.

There is a general lack of understanding about the benefits of adult education and the costs involved. Studies show that while education and training appear costly, the gains to society in general are

very high, much higher than for the supporting public agencies in terms of higher income taxes and lower welfare payments, and for the trainee himself. Returns to society appear so advantageous that investment in this type of education should take priority over many other public programs if maximum social and economic growth is the objective. Lack of support by taxpayers for larger appropriations toward upgrading the human capital stock of society will likely continue unless more research and information is made available to them, pointing out not only the general benefits, but also the fact that disadvantaged persons and regions should not be expected to pay their own way in training, because in most cases they are not the prime gainers. Thus, an excellent case can be made for a much more widely diffused financial base for adult education.

One of the prime areas for consideration may well be the inclusion of some measure of the inventory and status of the human capital resource of the nation, in the national accounts.[13] While national accountants place great importance on the inventory of capital equipment of the nation, including new investment and depreciation appraisals, the quality of human resources is largely ignored due to the difficulties in measurement, and the argument that education and training are largely consumptive rather than productive items. An increase in the stock of capital equipment including new technological advances, require a higher quality of human capital to complement it. Our lack of adequate recognition of this means in effect that we have been living out of depreciation of our human capital stock in the relative

[13] Dernburg, T.F., and McDougall, D.M., Macroeconomics, McGraw-Hill Book Company, New York, 1968.

sense that improvement in overall human skills has not kept pace with that of our capital equipment. The inclusion of a measure of new investment in human stock, along with that of machines and equipment would force tax payers and policy makers to make more objective decisions about education, especially for those people and those areas where relative depreciation has occurred more rapidly than new educational investment. The finances required to upgrade the present human resource would be large. Based on the estimates (table II) for rural eastern Washington with a population of only a quarter of a million people, even a two-year training program for those with less than a grade 8 education would come to more than 80 billion dollars for the nation as a whole. Had this need been met on a year to year basis, new investment requirements would not now be so large. It is highly doubtful that private investment increases in training will come about. Mobility of labor makes it unprofitable for private industries to expend large amounts in this area, unless they are subsidized for training programs they do offer.

Eastern Washington also shows characteristics of unequal and inadequate adult education programs to meet the requirements of a rapidly changing society. The financial assistance and programs in adult education are spasmotic and lack coordination. Federal and state programs that are available are frequently underutilized through lack of effective leadership and finance at the local level.

Residents of eastern Washington appear to share equitably on a per capita basis with the rest of the state for available funds.

While Cooperative Extension Service funds are allocated on a basis which is advantageous to residents of the area, the educational activities are largely agricultural. Thus, benefits are small for those wishing to leave agriculture. In 1966, approximately one-third of these funds were allocated to one-sixth of Washington's population. Similarly, of the $1,265,000 MDTA funds allocated at the state level in 1967, $252,000 was earmarked for the eastern Washington counties surveyed. Adequate information was not available for the other programs.

On the other hand, there appears to be an unequal sharing of funds by counties within the surveyed region. Generally, those counties with the greatest adult training needs, incurred the lowest per capita expenditures. These counties specifically are Lincoln, Pend Oreille, Stevens, Okanogan, and Columbia. Excluding the large Cooperative Extension Service expenditure, Ferry county would also fall in this class. All of these counties had more than 40 per cent of the males over 25 with an educational level less than grade 8, while adult education expenditures per capita were only half of that for all of the counties studied. Only one of these counties made substantial use of funds under the Vocational Education Act, and only two of the six had organized Community Action Associations by the end of 1967. While four out of the six have been allocated funds in table I under the MDTA program, it should be emphasized that these were arbitrary. These counties are included in an administrative region called the "Spokane Labor Area" and most of the funds are utilized in educational institutions in Spokane for training of persons from the surrounding counties.

Thus, while it appears that eastern Washington is sharing adult education funds more than equitably on a per capita basis, with the rest of the state, allocation within the area is very uneven. Furthermore, it does not appear that total funds allocated are sufficient to solve the adult education problem which exists.

EXHIBIT 11

The Academic Staff of the Department of Agricultural Economics and Rural Sociology

	Area of Specialization
T.W. Manning, Ph.D., Professor and Chairman	Agricultural and Resource Economics, Marketing.
L.P. Apedaile, Ph.D., Associate Professor	Agricultural Economics and Policy.
D.S. Gill, Ph.D., Assistant Professor	Rural Sociology and Extension.
M.H. Hawkins, Ph.D., Associate Professor	Agricultural Marketing and Management.
G.D.L. Hetland, M.Sc., Visiting Lecturer	Rural Sociology.
H.C. Love, Ph.D., Professor	Agricultural Production Economics and Management.
D.G. Murri, M.Sc., Assistant Professor	Rural Sociology.
T.A. Petersen, M.Sc., Associate Professor	Farm Management and Extension.
W.E. Phillips, Ph.D., Assistant Professor	Natural Resource Economics and Management.
J.J. Richter, Ph.D., Professor	Agricultural Economics and Policy.
J.A. Rosario, Ph.D., Visiting Lecturer	Agricultural Marketing and World Trade.
W.M. Schultz, Ph.D., Associate Professor	Agricultural Production Economics, Management and Resource Economics.
A.A. Warrack, Ph.D., Associate Professor	Agricultural Economics and Marketing.
O.G. Wasiuta, B.Sc., Administrative Officer	Agribusiness Management and Marketing.